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RYCKMAN'S EMERGENCY ACTION & CONSULTING TEAM

Site:	SUPERIOR
ID#:	MOD 6797/200
Break:	24
Owner:	3-3-88

REMEDIAL ACTION PROGRAM
for
TANK REMOVAL AND THE CONTAINERIZATION of
CONTAMINATED SLUDGES AND SOILS at
SUPERIOR SOLVENTS COMPANY
ST. LOUIS, MISSOURI

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March 3, 1988
REACT Project 1773.2

Prepared for
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REMEDIAL ACTION PROGRAM
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CONTAMINATED SLUDGES AND SOILS at
SUPERIOR SOLVENTS COMPANY
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I. SITE HISTORY

The Superior Oil Co., Inc. (Superior) site is located at the southwest quadrant of the intersection of Chouteau Avenue. Superior has had title to lots 1, 3, 6 and 7 since September 12, 1974. Superior leases and has leased lots 4, 5, 8, 9 and 10 from Missouri Pacific Railroad since September 21, 1974 (Figure 1).

Agent Orange, a mixture of 2, 4-D and 2, 4, 5-T was produced by Thompson Chemical Co. (now William T. Thompson Co.) on property that it leased from the Missouri Pacific Railroad at the site. Concurrent with the Thompson Chemical (TCC) tenure, Wood Treating Chemicals Company (WTC) occupied some or all of the adjacent lots now owned by Superior. WTC produced, used, and/or formulated pentachlorophenol (PCP products).

Since approximately April 1, 1975, Superior has operated a solvent terminal at the location. Virgin solvents are purchased from the manufacturers and shipped to Superior via railroad tank cars or trucks. The contents of the tank cars or trucks are then pumped into above ground storage tanks located on Superior's property or property leased from the Missouri Pacific Railroad. Once the solvents are in the storage tanks, they are either packed into 55-gallon drums on the drum filling dock or shipped to customers by bulk trucks. The bulk trucks are filled at the loading rack. Most solvent transfers take place through fixed piping to the drum dock or loading rack.

In 1984, the USEPA initiated a dioxin investigation at the site because EPA records indicated that Agent Orange had been produced at the site by TCC. The presence of dioxin, a

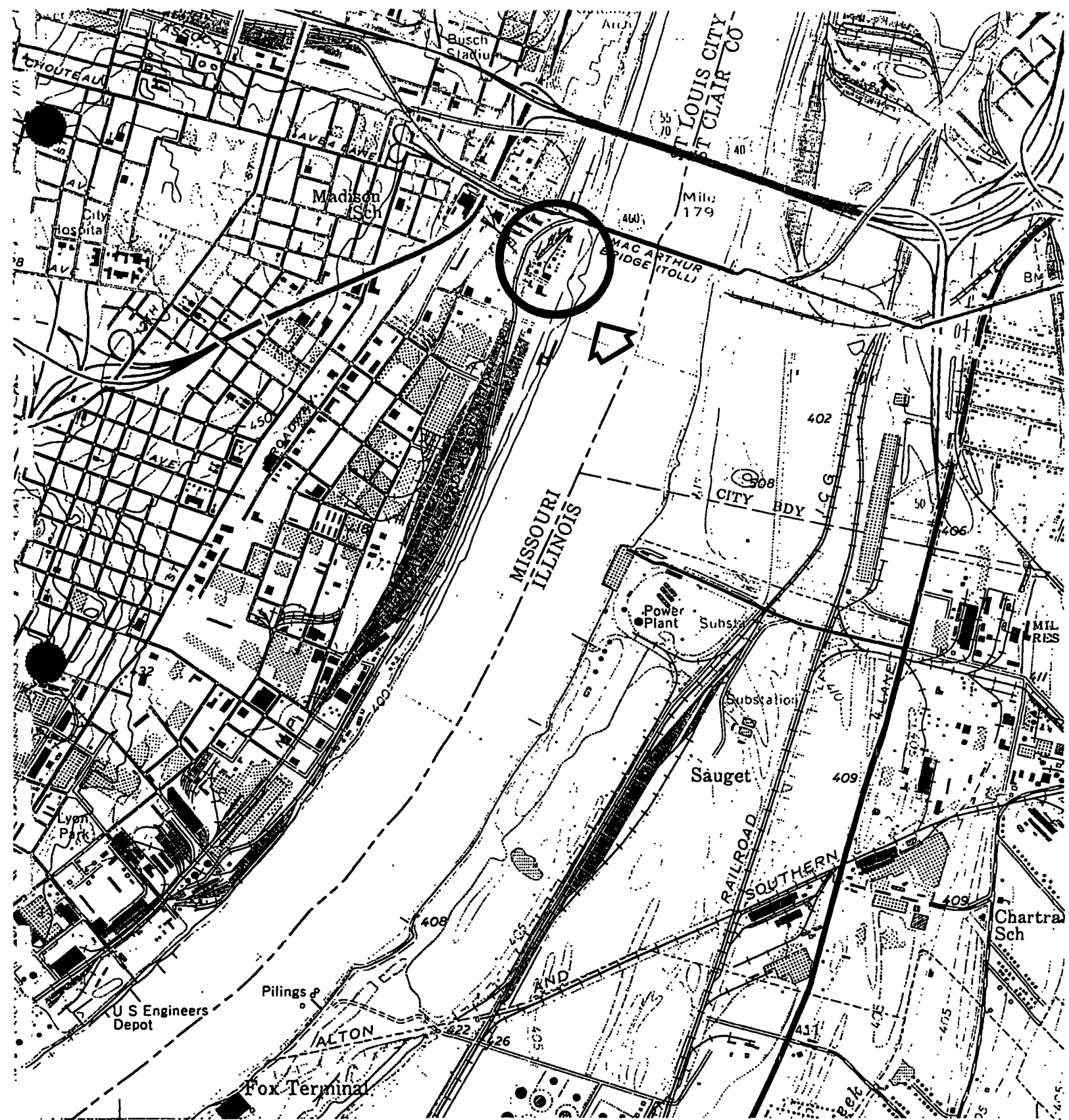


FIGURE 1. General Location Map showing the Superior Solvents/Thompson Chemical Site.

contaminant found in Agent Orange, allegedly was confirmed in two separate sampling and analysis tasks performed by the EPA in June 1984 and October 1984. Any contamination of the site is probably the result of spills associated with the manufacturing of 2, 4, 5-T or any of its formulated products.

During July 1984, Superior noticed a black tar-like substance surfacing on its property at the location shown in Figure 2. Excavation of the area revealed an underground tank containing tar-like sludges which appeared to be leaking. The tank may have been abandoned by WTC or by Allied which is believed to have operated a Tar Plant at this location from approximately 1919 to 1950.

In March, 1987, EPA sampled the interior surface of the interceptor sewer beneath the site at three locations in the vicinity of the buried tank. These samples showed concentrations of 2, 3, 7, 8 - TCDD ranging from 2 ppb to 12.7 ppb. EPA determined at that time that the release and/or threatened release of hazardous substances into the environment required that the contents of the tank and visibly contaminated soils around the tank be removed in an expeditious manner.

Superior Oil Co., Inc., negotiated a consent order with EPA to remove the underground tank. This report summarizes the techniques and procedures which were utilized during these removal actions.

II. SCOPE OF WORK

In accordance with the "Tank Contents Removal Plan" (TCRP), which was submitted to the U. S. Environmental Protection Agency on November 19, 1987, and subsequently approved on December 7, 1987, the scope of work involved the removal and containerization, to the maximum extent practicable, of the contents of the tank and the sludges surrounding it. The sludges and soils which were removed were to be stored on-site. The goal was to accomplish these tasks in a manner which would prevent structural damage to MSD's Mill Creek Sewer and minimize the off-site transport of hazardous materials (including fugitive dust, vapors, and erosion materials).

III. IMPLEMENTATION

The various project tasks have been outlined below and are followed by a brief description of how the remedial work was accomplished. The 1987 dates which appear in parentheses indicate the dates on which the respective tasks were performed. These dates are verified by time-dated photographs included as Figures 3 through 25. Figure 26 shows both the original project schedule and the actual work regimen which resulted in on-site remedial work being completed ahead of schedule.

A. Mobilization And Site Set-up (December 2, 3).

The area surrounding the partially buried tank was divided into three work zones as described below and shown in Figure 2.

1. Exclusion Zone.

The Exclusion Zone consisted of the active work area where sludge excavation and containerization of hazardous material occurred. The perimeters of this area were marked with brightly colored hazard tape as shown in Figure 3. All personnel entering the Exclusion Zone were required to wear the prescribed level of personal protective equipment. A list of each person entering this zone was recorded on a daily basis and is included on the "Daily Activities Log" which has been compiled in Appendix III.

2. Contamination Reduction Zone.

The Contamination Reduction Zone was situated immediately adjacent and to the east of the Exclusion Zone. Decontamination of tools, equipment, and personnel was conducted in this area. (see paragraph I, below).

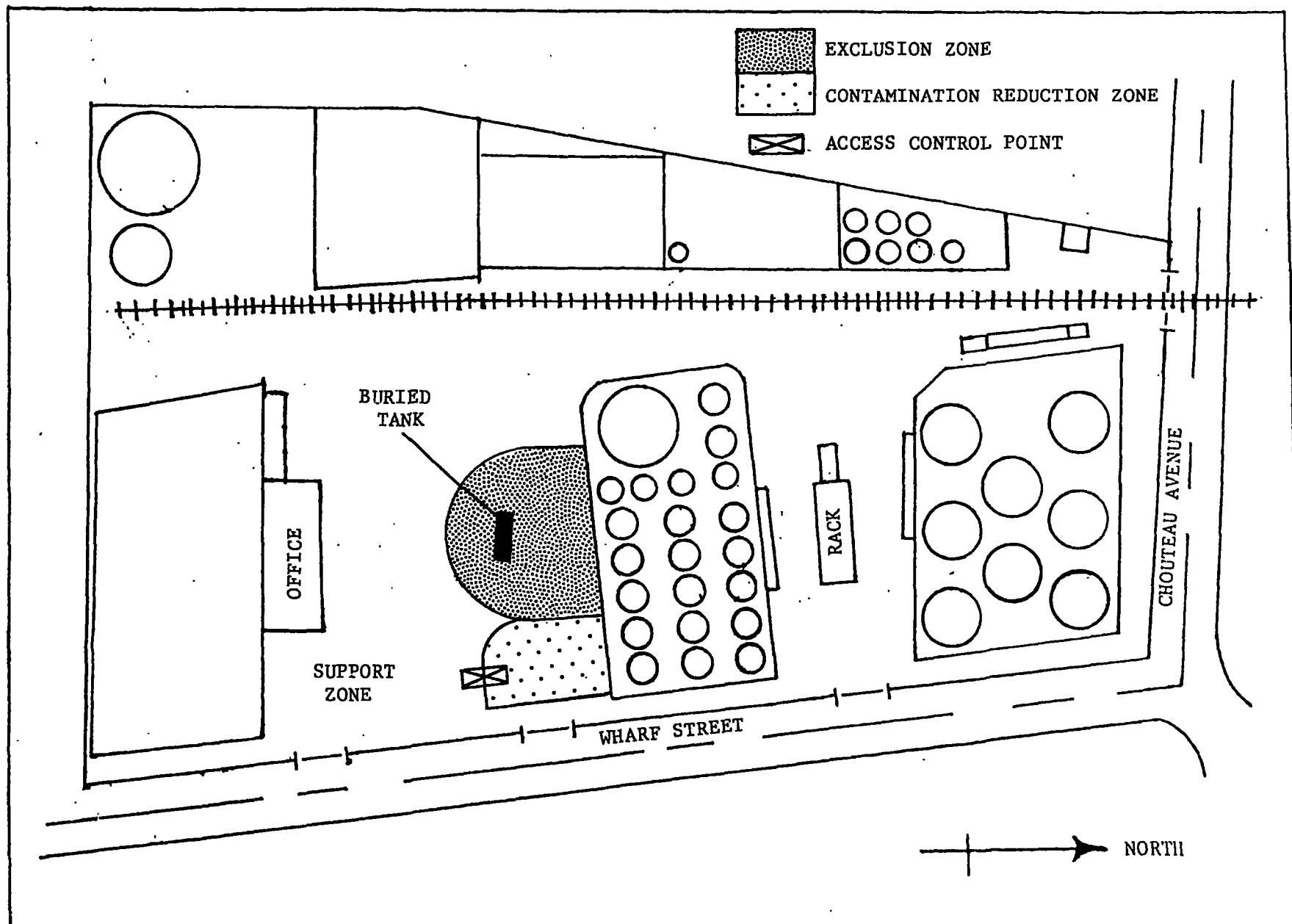


FIGURE 2. Approximate location of the Exclusion zone, the Contamination Reduction zone, and the Support zone around the buried tank.

3. Support Zone.

The Support Zone consisted of those areas around the Exclusion Zone and the Contamination Reduction Zone where trailers and supplies were staged.

B. Containerization of Pile (December 4, 10, 14, 17).

The visibly contaminated soil which was excavated from around the buried tank was added to the existing pile of material for subsequent containerization. Twenty cubic yard roll-off containers were staged in the exclusion zone and a Komatsu PC220LC Track Excavator was used to load the contaminated soil into these roll-offs (Figures 3 and 4). A geo-fabric apron was placed beneath the roll-off containers to prevent contamination of the exclusion zone during loading operations.

During removal operations, an air monitoring program was conducted to insure that fugitive dust emissions were maintained below acceptable levels. The features of this monitoring program were outlined in the TCRP, referenced above. A wind sock was set up in the support zone and used to establish wind direction once each hour. Three GCA PDM-3 "Miniram" particulate air monitors were calibrated relative to one another and placed on either side of the Exclusion Zone (one upwind and two downwind). Direct readings of airborne particulate levels were recorded on an hourly basis and have been compiled in Appendix II. In each case, the downwind particulate levels were maintained well below the "termination level" specified in the TCRP.

C. Removal of Top of Tank (December 4).

The atmosphere in and around the buried tank was checked with a MSA Model 2A Explosiometer prior to initiating work on the tank itself. No explosive vapors were detected (0% LEL). Personnel in level "B" protective gear then proceeded to cut away the top of the tank using an acetylene gas torch (Figure 5). Once the top of the tank had been completely cut away, the track excavator was used to place it into one of the adjacent roll-off containers (Figure 6).

D. Removal of Sludges From In and Around Tank (December 8, 9).

Personnel in level "B" protective gear used an air-hammer and shovel to loosen a portion of the solidified sludges in and around the buried tank as shown in Figures 7 and 8. Once the material was loosened, the track excavator was then used to transfer the bulk sludges into an adjacent roll-off container (Figure 9).

E. Excavation and Containerization of the Tank (December 9).

Once the sludges had been removed from in and around the tank, an inspection was made by personnel in level "B" protective gear to verify that no direct connection existed between the tank and the underlying Mill Creek sewer line. The track excavator was then used to lift out the empty tank as shown in Figures 10 and 11. Personnel working in level "B" protective gear used an acetylene gas torch to cut up the tank so that it could be placed in one of the steel roll-off containers (Figure 12).

F. Final Soil Removal and Staging of Roll-Off Containers
(December 8, 9, 10, 14, 17).

With the successful containerization of the tank and the sludges around it, the remaining remedial work was performed in level "C" protective gear. Visibly contaminated soils were excavated and added to the pile of material for subsequent containerization.

At the end of each day, the excavation and soil pile was covered with 6-mil plastic sheeting as shown in Figure 13 to keep the pile dry and to prevent contaminant run-off from entering the excavation. Roll-off containers were delivered to the site and staged in the exclusion zone on an as-needed basis. The track excavator was used to transfer soil from the pile into the roll-off containers.

Once each roll-off container was filled, a steel lid was placed over the container (shown in Figure 3). The roll-off was numbered and secured with two padlocks on opposite corner (Figure 14). The roll-off containers were staged in two areas at the southwest corner of the property as shown in Figures 15 and 16. The relative location of the twelve roll-off containers is shown on the schematic presented as Figure 27.

During the excavation process, a wooden conduit was uncovered on the south wall of the excavation. The conduit measured approximately twelve inches high by eight inches wide (see Figure 17) and appeared to be filled with a black viscous, tar-like material, not unlike what had been removed from the buried tank. There was no evidence of a direct connection between the conduit and the tank. EPA was promptly notified of this development and sent their project manager (Ms. Pauletta France-Isetts) out to the project site in order to inspect the conduit and provide further recommendations.

REACT personnel in level "C" protective gear collected and split samples of the material from within the conduit with EPA's on-scene coordinator. After the EPA inspection, the location of the conduit was tied into four reference points on the site. Each of these four reference points is provided as Figure 28.

G. Performance Sampling (December 10).

Once all of the visibly contaminated soils had been removed from the excavation, four discrete soil samples were collected from the bottom surface (Figure 18). Two of these samples (#E-1 and #E-2) were taken from depths of 8'0" and 8'4" north of the excavation centerline. The remaining two samples (E-3 and E-4) were "deep" samples taken south of the excavation centerline at depths of 8'10" and 9'8", respectively. The relative location of these four sampling points are shown in Figure 29. In each case, samples were collected by personnel in level "C" protective gear using a stainless steel trowel which had been decontaminated with a soap and water wash, deionized water rinse, acetone rinse, and a final rinse with deionized water. Soil samples were placed in laboratory cleaned glass jars (I-Chem Lot #10208713) and packed in individual paint cans for shipment to the laboratory. The sample transmittal form and chain-of-custody record is attached as Appendix IV. All four samples were analyzed for 2, 3, 7, 8-TCDD, B/N/A's, and total phenols. In addition, samples #E-2 and #E-4 were also run for volatile organics. A copy of the laboratory results is presented in Appendix I.

H. Lining and Backfilling Excavation (December 11, 17, 18).

After the performance samples had been collected, the excavation was lined with Amoco 2002, a permeable geofabric, as shown in Figure 19. Two truckloads of clean sand were used to backfill the excavation (Figure 20) and the sand was then covered with a truckload of clay to reduce water percolation rates through the soil column. The track excavator was used to compact this material after each load. Once the hole had been completely backfilled, seventy-two tons of one-inch minus gravel were used to restore the work area and allow for subsequent truck traffic over the disturbed area. A Cat 426 front-end loader was used to spread the gravel as required.

I. Decontamination (December 18).

The track excavator, backhoe, and all recoverable equipment were decontaminated prior to their demobilization off site. The buckets which had been used to move contaminated soils and/or sludges were cleaned using a soap and water solution (Figure 21), followed by an acetone rinse. A picture of the front-end loader after decontamination is shown in Figure 22.

Decontamination of work tools and doffing of personal protective gear was accomplished on a daily basis, as required. All personnel inside the exclusion zone were required to pass through the contamination reduction zone where disposable protective equipment was removed and containerized (Figure 23). All contaminated clothing and equipment, including Tyvek suits, boot covers, gloves, and respirator cartridges were bagged and placed in the roll-off containers for on-site storage.

J. Demobilization (December 18).

Once all on site work activities had been completed and all materials had been decontaminated, personnel and equipment were demobilized from the site. Figures 24 and 25 show the work area on-site after site restoration activities had been completed.

IV. PROJECT RESULTS

1. Approximately 225 cubic yards of contaminated sludges and soil were excavated from the area around the buried tank and on-site engineered storage was provided.
2. Contaminated material was excavated in a manner which prevented structural damage to MSD's Mill Creek Sewer and was containerized so that off-site transport of hazardous materials (including fugitive dust and erosion) was minimized. Downwind particulate levels were maintained well below the action level specified in TCRP at all times.
3. Project was completed within the original budget and ahead of schedule, even though the volume of contaminated material which had to be removed was twice the original estimate.
4. Work was accomplished in a safe manner with no adverse health impacts to on-site personnel.
5. The remedial work was completed with a minimal amount of disruption to on-site operations and with no adverse publicity.

V. RECOMMENDATIONS

1. Superior should undertake weekly inspections of each roll-off container to identify any deficiencies and initiate corrective actions, if required, in a timely manner. A copy of the inspection checklist was provided in the TCRP as Figure 5.
2. The roll-off containers stored on-site should be painted twice a year with an enamel rust inhibitor to provide the maximum serviceable life. In addition, it is recommended that these containers be covered with a waterproof tarp to prevent water from ponding on the roll-off lids.
3. The area where the tank was excavated from may experience some additional settling over time as the fill material is consolidated under the weight of on-site truck traffic. Gravel should be added as necessary to maintain the desired site contours.

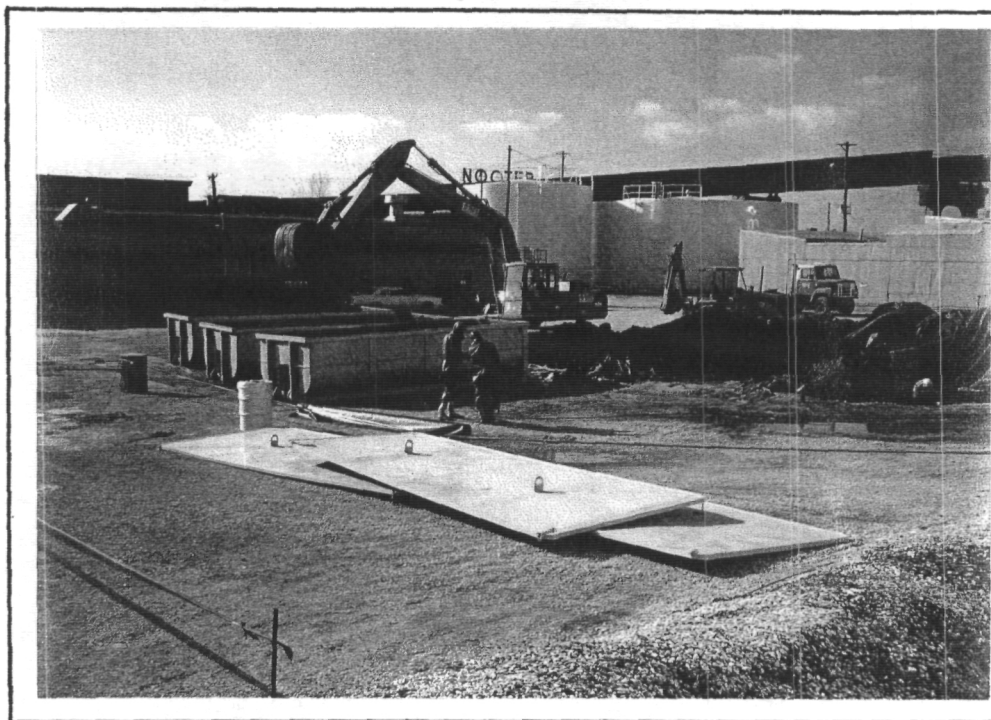


Figure 3. A track excavator was used to transfer contaminated material into roll-off containers within the exclusion zone. Note the lids which were staged in the contamination reduction zone.

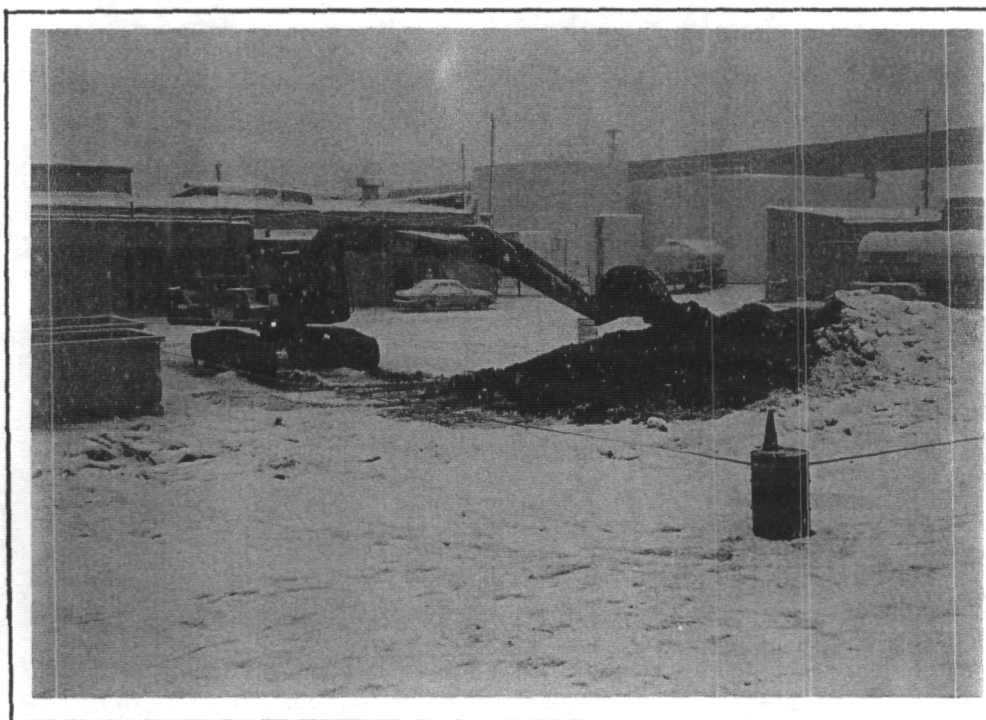


Figure 4. Loading operations continued despite severe weather conditions which were encountered near the end of the project.



Figure 5. Personnel in level "B" protective gear used an acetylene gas torch to cut away the top of the buried tank.

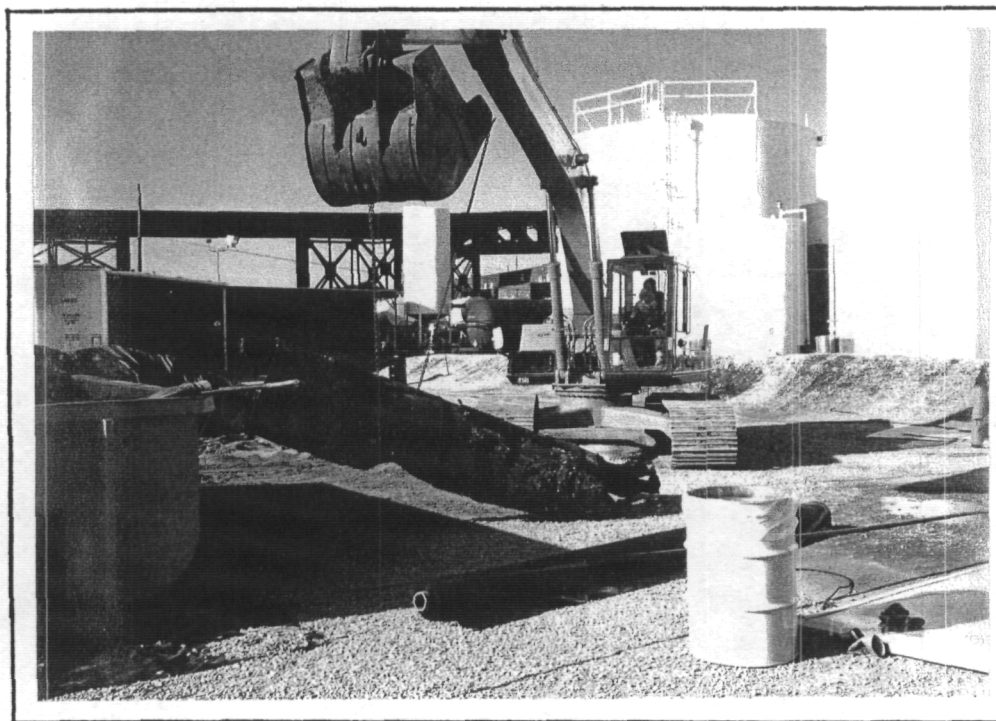


Figure 6. The track excavator was used to transfer the top of the tank into a roll-off container.



Figure 7 (above) and Figure 8 (below). Personnel in level "B" protective gear used air hammers and shovels to loosen sludges inside of the tank prior to bulk removal.



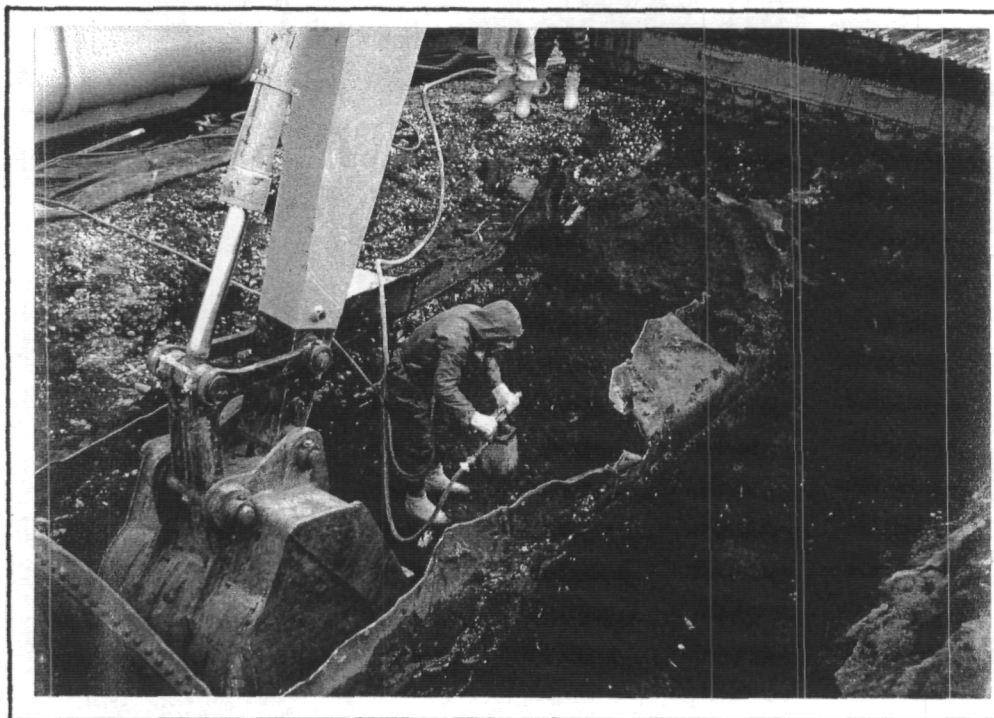


Figure 9. The track excavator was used to accomplish bulk removal of sludges within the buried tank.



Figure 10. Once the sludges had been removed, the buried tank was able to be excavated.

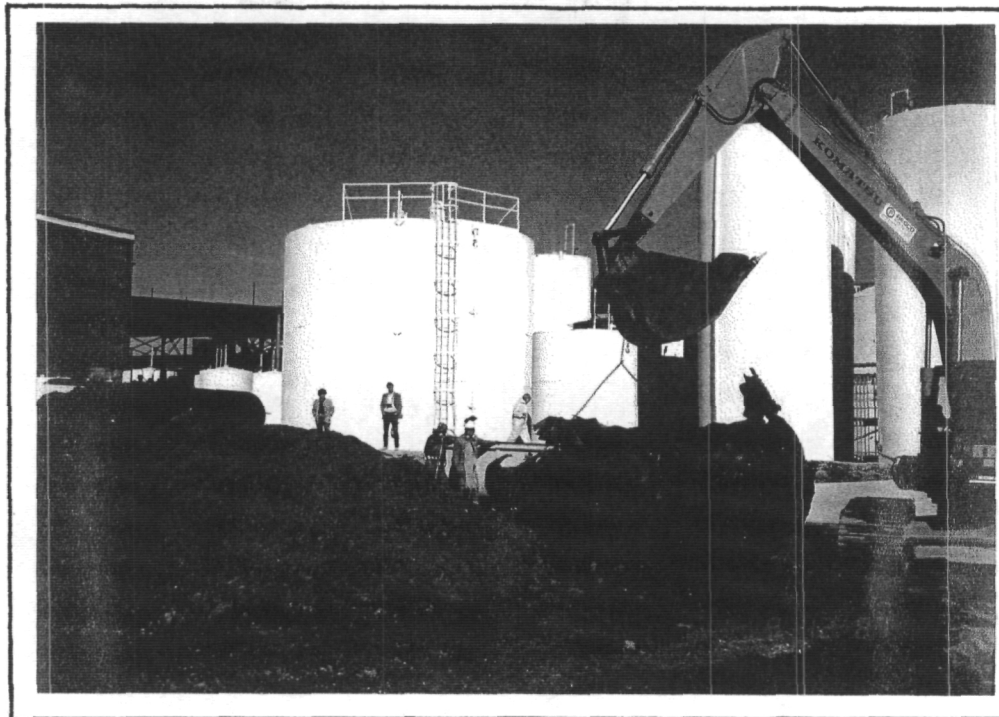


Figure 11. The buried tank after removal.



Figure 12. Personnel in level "B" protective gear used an acetylene gas torch to cut up the tank for subsequent containerization.

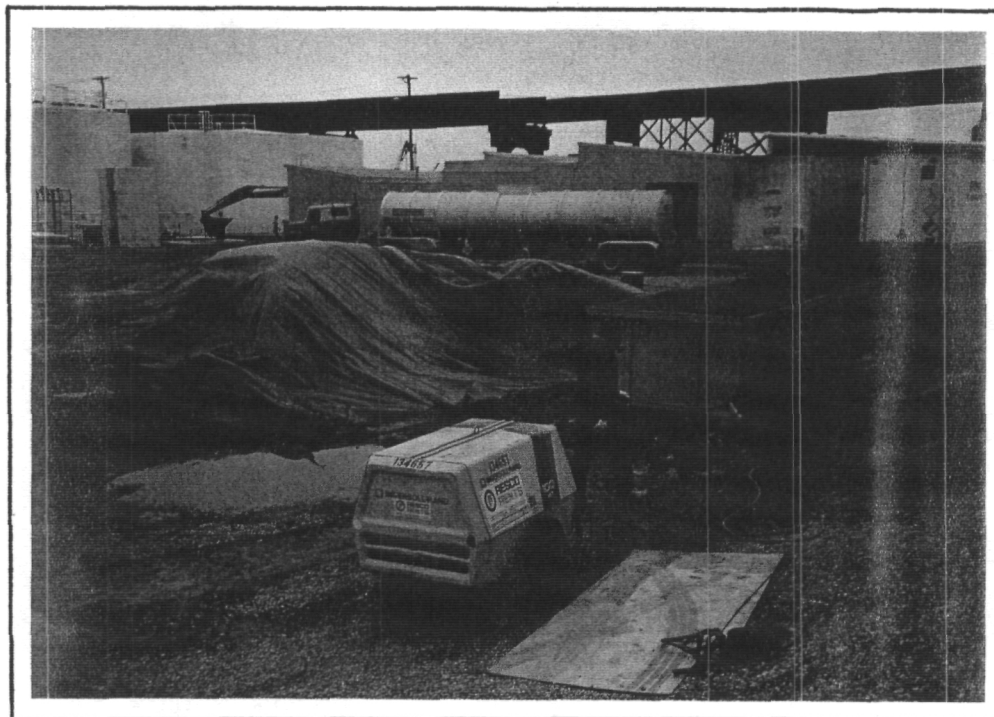


Figure 13. Plastic sheeting was used to keep the pile dry and to prevent contaminated runoff from entering the excavation.

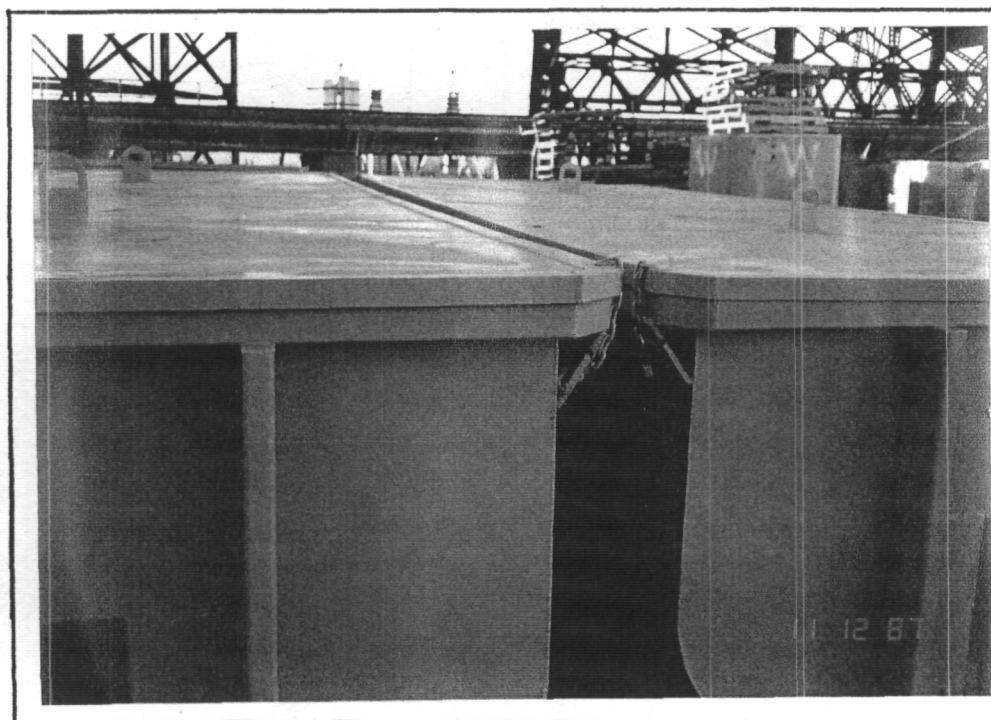


Figure 14. Each roll-off container was numbered and locked before being stored on-site.

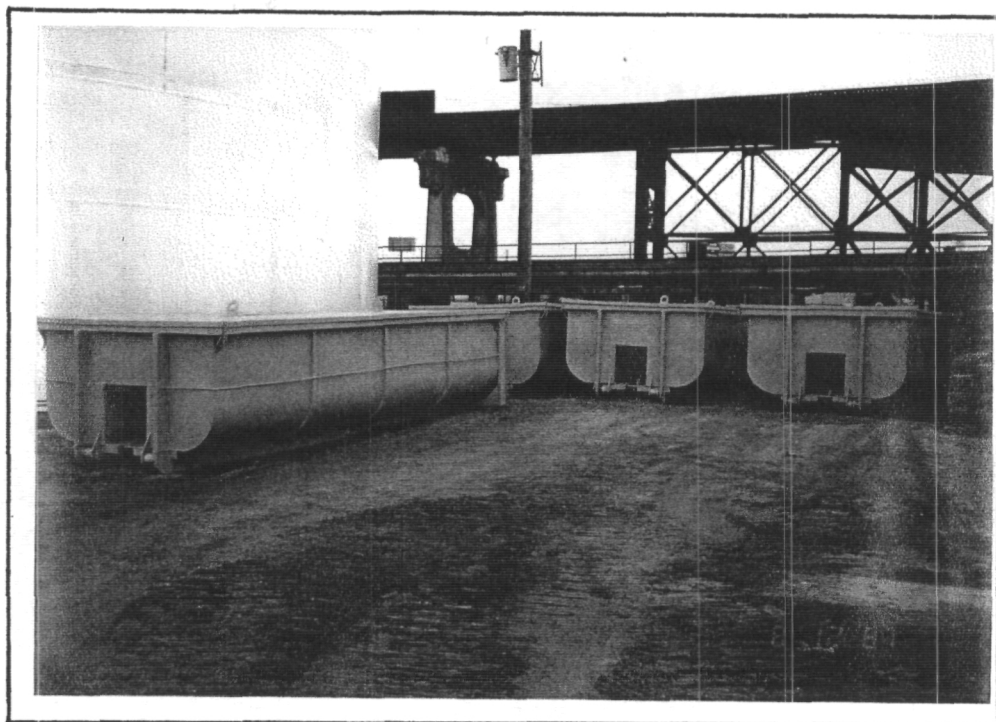


Figure 15. A view of roll-offs 1, 2, 3, and 4 which were staged on the southwest corner of the property for on-site storage.

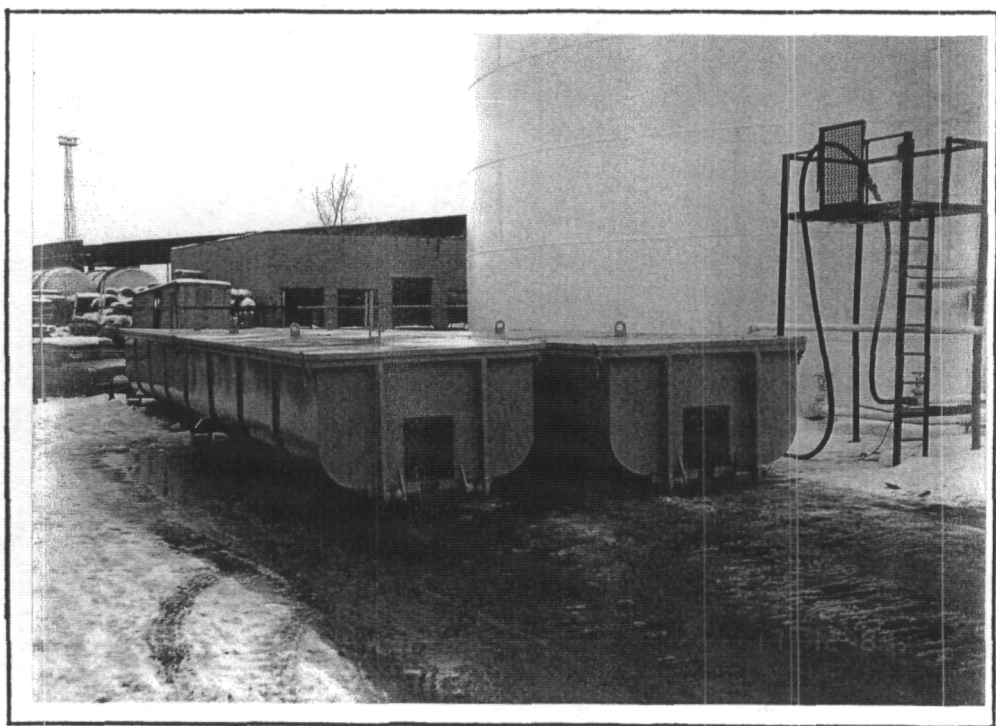


Figure 16. Roll-offs 7, 8, 9, and 10.



Figure 17. The wooden conduit located on the south wall of the excavation which was discovered while removing contaminated soils.



Figure 18. Collection of performance samples from the bottom of the excavation. Note the wooden conduit on the south wall.

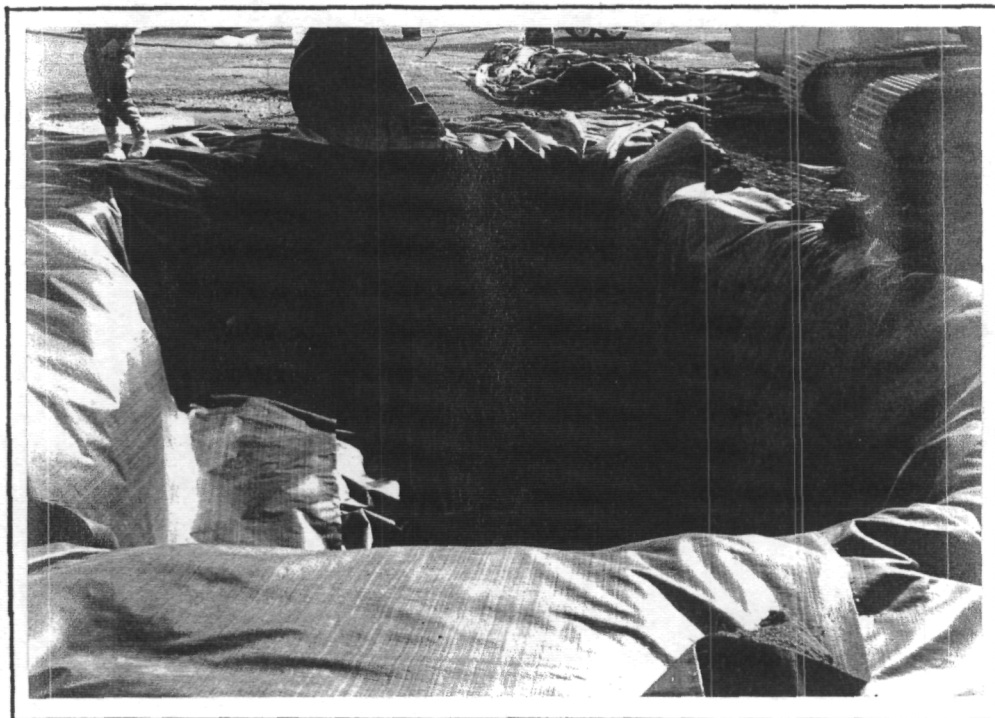


Figure 19. The excavation was lined with Amoco 2002 geofabric prior to being backfilled.

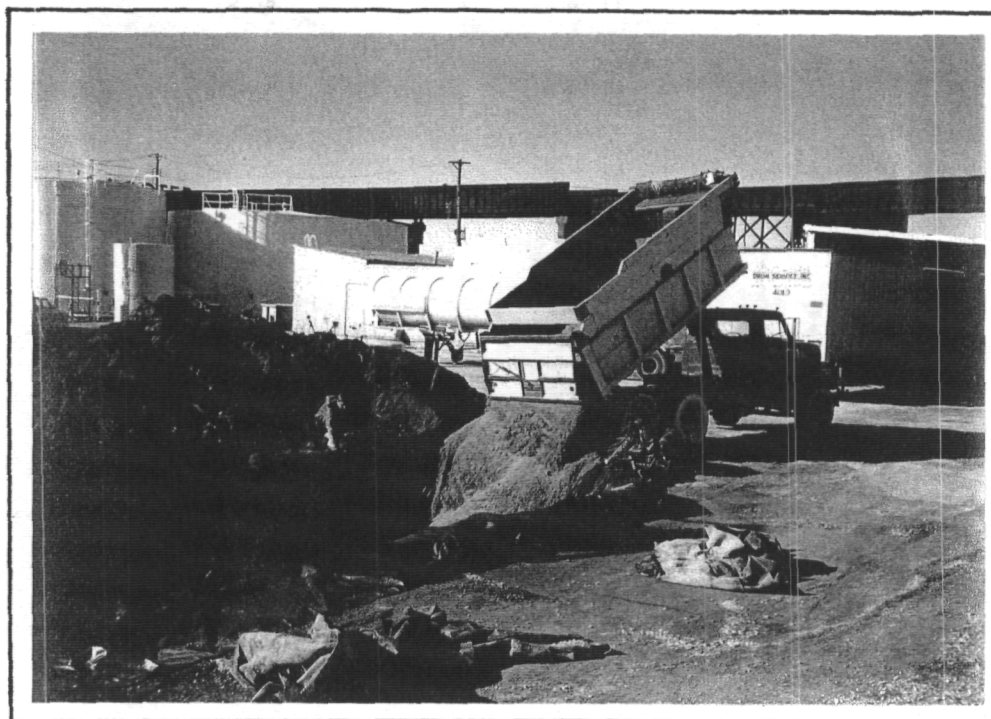


Figure 20. Clean sand and clay was used to backfill the excavation.



Figure 21. The excavator bucket was decontaminated using a soap and water solution followed by an acetone rinse.



Figure 22. The front-end loader after decontamination.

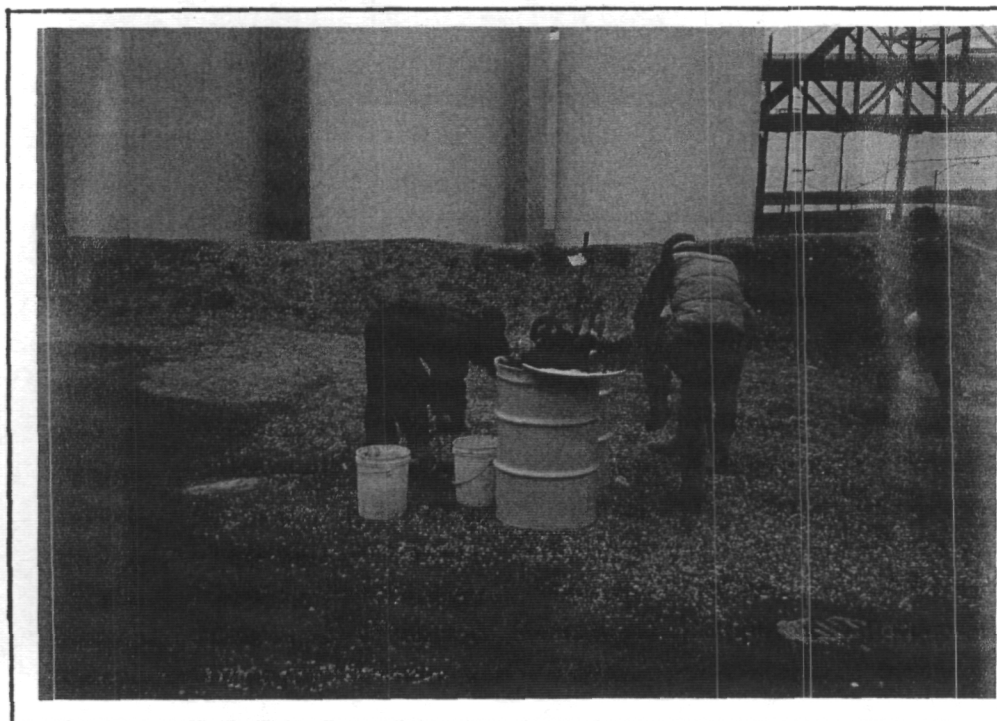
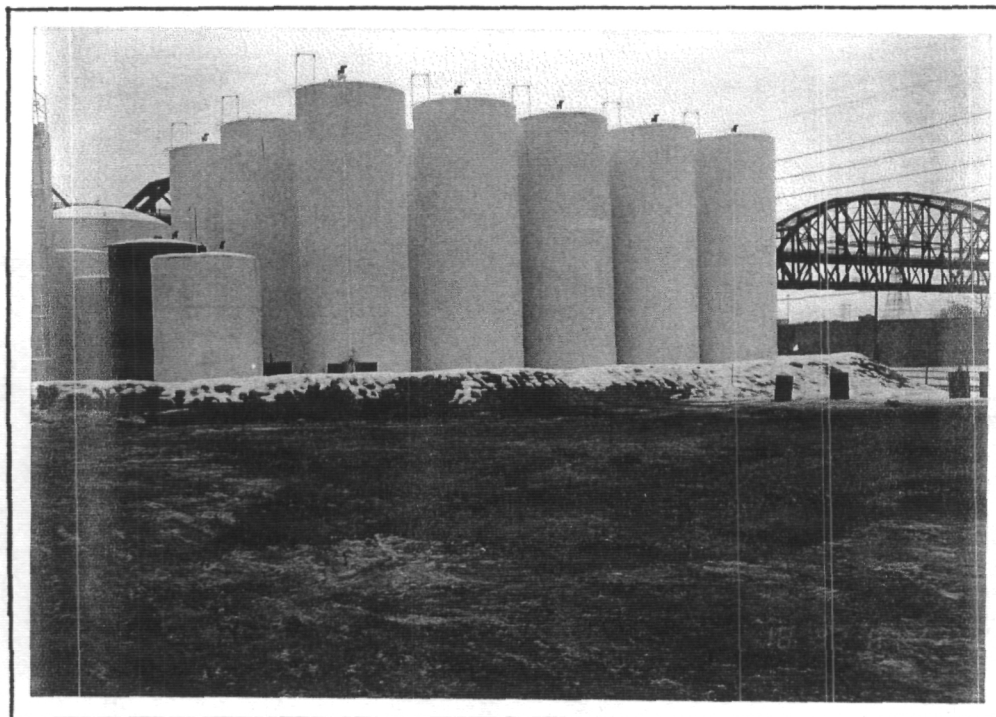


Figure 23. Disposal of personal protective equipment took place in the contamination reduction zone.



Figure 24 (above) and Figure 25 (below). A view of the work site after restoration activities had been completed. Note clean gravel which was placed over the area to allow for unrestricted truck traffic.



P R O J E C T S C H E D U L E

TASK	1	2	3	4	5	6	DAY 7	8	9	10	11	12
1. MOBILIZATION	+	+										
2. CONTAINERIZE PILE			+			○		○	○			
3. REMOVE TOP OF TANK			○	+								
4. REMOVE SLUDGES FROM IN AND AROUND TANK				○	+	+	+	+				
5. REMOVE TANK					○		+	+	+			
6. REMOVE SOIL — STAGE ROLL-OFFS				○	+	+	+	+				
7. PERFORMANCE SAMPLING						○			+	+		
8. LINE & BACKFILL EXCAVATION							○		○	+	+	
9. DECONTAMINATE EQUIPMENT							○			○	+	+
10. DEMOBILIZATION										○	+	+
+ - PROJECTED												
○ - ACTUAL												

Figure 26. Time line showing projected schedule and actual completion dates for the primary project tasks.

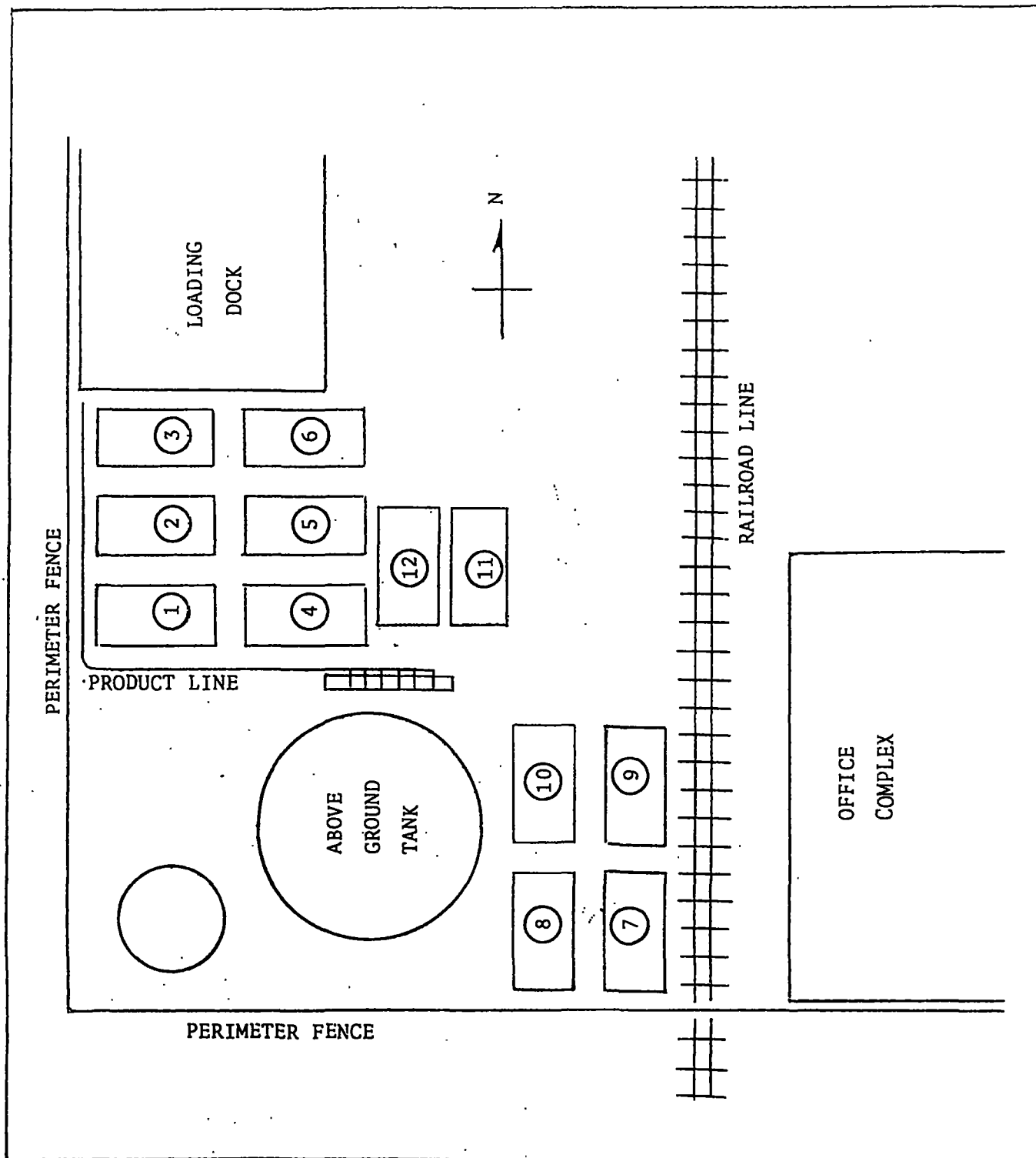


Figure 27. Schematic showing the relative location of the twelve roll-off containers staged on the Superior property for on-site storage.

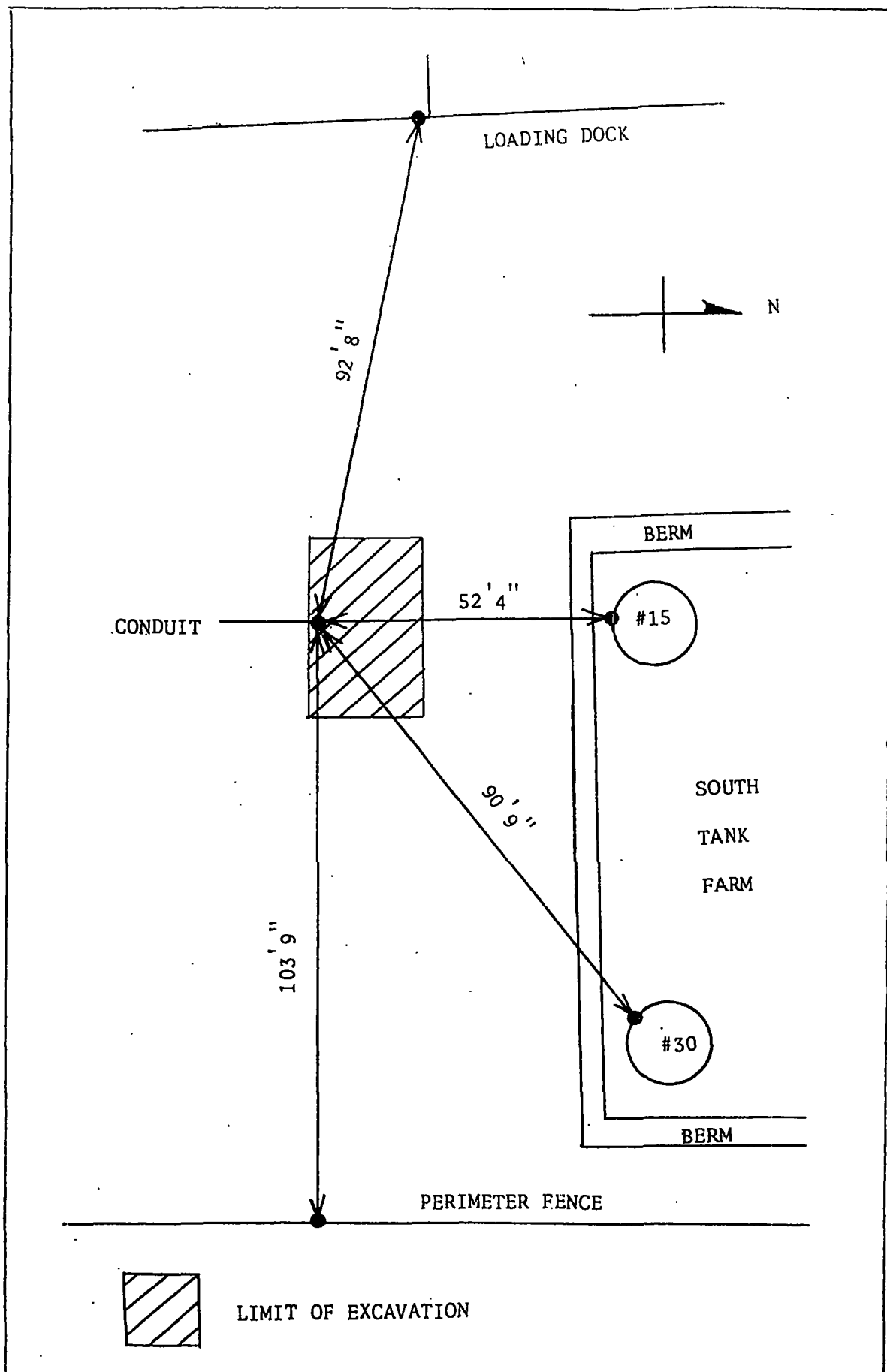


Figure 28. Schematic showing location of the conduit discovered during excavation of the buried tank.

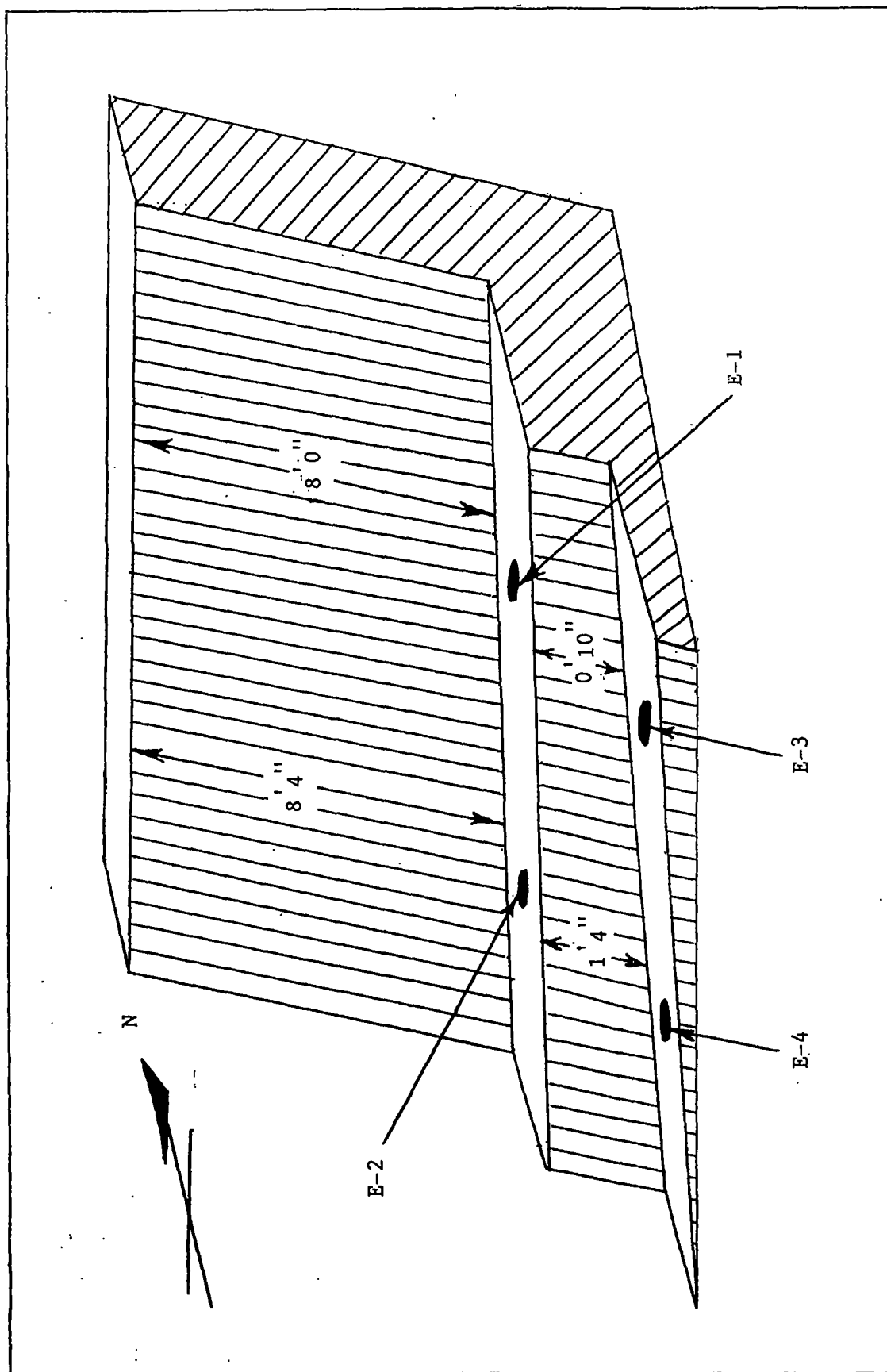


Figure 29. Schematic showing the relative location of the four soil sampling points in the excavation.

APPENDIX I

COMPOUND LIST

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ACID EXTRACTABLES

SAMPLE IDENTIFIER: E1
COMPUCHEM® SAMPLE NUMBER: 172837

	CONCENTRATION (ug/kg) <i>ME</i>	DETECTION LIMIT (ug/kg)
1A. PHENOL	BDL	330
2A. 2-CHLOROPHENOL	BDL	330
3A. 2-NITROPHENOL	BDL	330
4A. 2,4-DIMETHYLPHENOL	180 J	330
5A. 2,4-DICHLOROPHENOL	4500	330
6A. P-CHLORO-M-CRESOL	BDL	330
7A. 2,4,6-TRICHLOROPHENOL	6400	330
8A. 2,4-DINITROPHENOL	BDL	1600
9A. 4-NITROPHENOL	BDL	1600
10A. 4,6-DINITRO-O-CRESOL	BDL	1600
11A. PENTACHLOROPHENOL	96000††	25000††

Surrogate Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
2-Fluorophenol	<u>42</u>	<u>(25-121)</u>
D ₅ -Phenol	<u>48</u>	<u>(24-113)</u>
2,4,6-Tribromophenol	<u>75</u>	<u>(19-122)</u>

BDL=BELOW DETECTION LIMIT

††These values were obtained from a 15:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the undiluted sample.

J=Estimated concentration; values are between the detection limit and one-half of that limit.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: E1
COMPUCHEM® SAMPLE NUMBER: 172837

	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
1B. N-NITROSODIMETHYLAMINE	BDL	330
2B. BIS (2-CHLOROETHYL) ETHER	BDL	330
3B. 1,3-DICHLOROBENZENE	BDL	330
4B. 1,4-DICHLOROBENZENE	BDL	330
5B. 1,2-DICHLOROBENZENE	BDL	330
6B. BIS (2-CHLOROISOPROPYL) ETHER	BDL	330
7B. N-NITROSODI-N-PROPYLAMINE	BDL	330
8B. HEXACHLOROETHANE	BDL	330
9B. NITROBENZENE	BDL	330
10B. ISOPHORONE	BDL	330
11B. BIS(2-CHLOROETHOXY) METHANE	BDL	330
12B. 1,2,4-TRICHLOROBENZENE	BDL	330
13B. NAPHTHALENE	110000††	6600††
14B. HEXACHLOROBUTADIENE	BDL	330
15B. HEXACHLOROCYCLOPENTADIENE	BDL	330
16B. 2-CHLORONAPHTHALENE	BDL	330
17B. DIMETHYLPHTHALATE	BDL	330
18B. ACENAPHTHYLENE	4200	330
19B. 2,6-DINITROTOLUENE	BDL	330
20B. ACENAPHTHENE	25000††	6600††
21B. 2,4-DINITROTOLUENE	BDL	330
22B. DIETHYLPHTHALATE	BDL	330
23B. 4-CHLOROPHENYL PHENYL ETHER	BDL	330
24B. FLUORENE	33000††	6600††
25B. DIPHENYLAMINE (N-NITROSO)	7100	330
26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	330
27B. 4-BROMOPHENYL PHENYL ETHER	BDL	330
28B. HEXACHLOROBENZENE	BDL	330

(Continued)

BDL=BELOW DETECTION LIMIT

††These values were obtained from a 20:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the undiluted sample.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

(Page Two)

SAMPLE IDENTIFIER: E1
COMPUCEM® SAMPLE NUMBER: 172837

	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
29B. PHENANTHRENE	100000††	6600††
30B. ANTHRACENE	28000††	6600††
31B. DI-N-BUTYLPHTHALATE	BDL	330
32B. FLUORANTHENE	75000††	6600††
33B. BENZIDINE	BDL	1600
34B. PYRENE	61000††	6600††
35B. BUTYLBENZYLPHTHALATE	BDL	330
36B. BENZO(A)ANTHRACENE	20000††	6600††
37B. 3,3'-DICHLOROBENZIDINE	BDL	660
38B. CHRYSENE	18000††	6600††
39B. BIS(2-ETHYLHEXYL)PHTHALATE	BDL	330
40B. DI-N-OCTYLPHTHALATE	BDL	330
41B. BENZO(B)FLUORANTHENE	26000††(1)	6600††
42B. BENZO(K)FLUORANTHENE	26000††(1)	6600††
43B. BENZO(A)PYRENE	16000††	6600††
44B. INDENO(1,2,3-C,D)PYRENE	3400	330
45B. DIBENZO(A,H)ANTHRACENE	1300	330
46B. BENZO(G,H,I)PERYLENE	3500	330

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
D ₅ -Nitrobenzene	<u>79</u>	<u>(23-120)</u>
2-Fluorobiphenyl	<u>47</u>	<u>(30-115)</u>
D ₁₄ -Terphenyl	<u>71</u>	<u>(18-137)</u>
D ₁₀ -Pyrene*	<u>65</u>	<u>*</u>

BDL=BELOW DETECTION LIMIT

*Advisory Surrogate; therefore no control range.

††These values were obtained from a 20:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the undiluted sample.

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: E1
COMPUCHEM SAMPLE NUMBER: 172838

	<u>CONCENTRATION</u> (mg/kg)	<u>DETECTION LIMIT</u> (mg/kg)
1. PHENOL, TOTAL	5.5	0.10

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: E4
COMPUCHEM SAMPLE NUMBER: 172845

	<u>CONCENTRATION</u> (mg/kg)	<u>DETECTION LIMIT</u> (mg/kg)
1. PHENOL, TOTAL	9.5	0.10

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: E3
COMPUCHEM SAMPLE NUMBER: 172843

	<u>CONCENTRATION</u> (mg/kg)	<u>DETECTION LIMIT</u> (mg/kg)
1. PHENOL, TOTAL	34	0.10

COMPOUND LIST

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ACID EXTRACTABLES

SAMPLE IDENTIFIER: E2
COMPUCEM® SAMPLE NUMBER: 172839

	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
1A. PHENOL	BDL	330
2A. 2-CHLOROPHENOL	BDL	330
3A. 2-NITROPHENOL	BDL	330
4A. 2,4-DIMETHYLPHENOL	BDL	330
5A. 2,4-DICHLOROPHENOL	570	330
6A. P-CHLORO-M-CRESOL	BDL	330
7A. 2,4,6-TRICHLOROPHENOL	3600	330
8A. 2,4-DINITROPHENOL	BDL	1600
9A. 4-NITROPHENOL	BDL	1600
10A. 4,6-DINITRO-O-CRESOL	5000 ^{††} BDL	1600
11A. PENTACHLOROPHENOL	5000 ^{††}	17000 ^{††}

Surrogate Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
2-Fluorophenol	<u>45</u>	<u>(25-121)</u>
D ₅ -Phenol	<u>44</u>	<u>(24-113)</u>
2,4,6-Tribromophenol	<u>49</u>	<u>(19-122)</u>

BDL=BELOW DETECTION LIMIT

^{††}These values were obtained from a 10:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the undiluted sample.

COMPOUND LIST

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BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: E2
COMPUCHEM® SAMPLE NUMBER: 172839

	CONCENTRATION (ug/kg)	DETECTION† LIMIT (ug/kg)
1B. N-NITROSODIMETHYLAMINE	BDL	1700
2B. BIS (2-CHLOROETHYL) ETHER	BDL	1700
3B. 1,3-DICHLOROBENZENE	BDL	1700
4B. 1,4-DICHLOROBENZENE	BDL	1700
5B. 1,2-DICHLOROBENZENE	BDL	1700
6B. BIS (2-CHLOROISOPROPYL) ETHER	BDL	1700
7B. N-NITROSODI-N-PROPYLAMINE	BDL	1700
8B. HEXACHLOROETHANE	BDL	1700
9B. NITROBENZENE	BDL	1700
10B. ISOPHORONE	BDL	1700
11B. BIS(2-CHLOROETHOXY) METHANE	BDL	1700
12B. 1,2,4-TRICHLOROBENZENE	BDL	1700
13B. NAPHTHALENE	5300	1700
14B. HEXACHLOROBUTADIENE	BDL	1700
15B. HEXACHLOROCYCLOPENTADIENE	BDL	1700
16B. 2-CHLORONAPHTHALENE	BDL	1700
17B. DIMETHYLPHTHALATE	BDL	1700
18B. ACENAPHTHYLENE	1700	1700
19B. 2,6-DINITROTOLUENE	BDL	1700
20B. ACENAPHTHENE	3200	1700
21B. 2,4-DINITROTOLUENE	BDL	1700
22B. DIETHYLPHTHALATE	BDL	1700
23B. 4-CHLOROPHENYL PHENYL ETHER	BDL	1700
24B. FLUORENE	3600	1700
25B. DIPHENYLAMINE (N-NITROSO)	BDL	1700
26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	1700
27B. 4-BROMOPHENYL PHENYL ETHER	BDL	1700
28B. HEXACHLOROBENZENE	BDL	1700

(Continued)

BDL=BELOW DETECTION LIMIT

†See Quality Assurance Notice #1.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

(Page Two)

SAMPLE IDENTIFIER: E2
 COMPUCHEM® SAMPLE NUMBER: 172839

	CONCENTRATION (ug/kg)	DETECTION† LIMIT (ug/kg)
29B. PHENANTHRENE	20000	1700
30B. ANTHRACENE	6100	1700
31B. DI-N-BUTYLPHTHALATE	BDL	1700
32B. FLUORANTHENE	26000	1700
33B. BENZIDINE	BDL	8300
34B. PYRENE	28000	1700
35B. BUTYLBENZYLPHTHALATE	BDL	1700
36B. BENZO(A)ANTHRACENE	10000	1700
37B. 3,3'-DICHLOROBENZIDINE	BDL	3300
38B. CHRYSENE	960 J	1700
39B. BIS(2-ETHYLHEXYL)PHTHALATE	BDL	1700
40B. DI-N-OCTYLPHTHALATE	BDL	1700
41B. BENZO(B)FLUORANTHENE	5700(1)	1700
42B. BENZO(K)FLUORANTHENE	5700(1)	1700
43B. BENZO(A)PYRENE	3900	1700
44B. INDENO(1,2,3-C,D)PYRENE	BDL	1700
45B. DIBENZO(A,H)ANTHRACENE	1000 J	1700
46B. BENZO(G,H,I)PERYLENE	1100 J	1700

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
D ₅ -Nitrobenzene	<u>36</u>	<u>(23-120)</u>
2-Fluorobiphenyl	<u>42</u>	<u>(30-115)</u>
D ₁₄ -Terphenyl	<u>50</u>	<u>(18-137)</u>
D ₁₀ -Pyrene*	<u>58</u>	<u>*</u>

BDL=BELOW DETECTION LIMIT

*Advisory Surrogate; therefore no control range.

J=Estimated concentration; values are between the detection limit and one-half of that limit.

(1)Indistinguishable Isomers.

†See Quality Assurance Notice #1.

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
 LIBRARY SEARCH RESULTS OF EXTRANEEOUS PEAKS &
 ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
 ANALYTICAL FRACTION: Base/Neutral

DATA FILENAME: BD072839C05

SAMPLE # 172839

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS OI UK	ESTIMATED CONC.(ug/k
1	690	91-57-6	NAPHTHALENE,2-METHYL-	83.4	<u> </u> <u>X</u> <u> </u>	1600
2	744	573-98-8	NAPHTHALENE,1,2-DIMETHYL-	85.5	<u> </u> <u>X</u> <u> </u>	3100
3	794	132-64-9	DIBENZOFURAN	55.9	<u> </u> <u> </u> <u>X</u>	3900
4	807	544-76-3	HEXADECANE	68.8	<u> </u> <u>X</u> <u> </u>	2000
5	890	13475-75-7	PENTADECANE,8-HEXYL-	59.3	<u> </u> <u> </u> <u>X</u>	1700
6	970	203-64-5	4H-CYCLOPENTA[DEF]PHENANTHRENE	60.6	<u> </u> <u> </u> <u>X</u>	4200
7	1075	2381-21-7	PYRENE,1-METHYL-	72.1	<u> </u> <u>X</u> <u> </u>	1800
8	1161	92-24-0	NAPHTHACENE	75.8	<u> </u> <u>X</u> <u> </u>	5800
9	1309	205-82-3	BENZO[J]FLUORANTHENE	75.6	<u> </u> <u>X</u> <u> </u>	5000

166.000 40.00

SPECTROSCOPIST SDW

DATE 12/23/87

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
 OI - ISOMER OR SIMILAR COMPOUND
 UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST - CLASSICAL PARAMETERS

SAMPLE IDENTIFIER: E2
COMPUCHEM SAMPLE NUMBER: 172840

	<u>CONCENTRATION</u> (mg/kg)	<u>DETECTION LIMIT</u> (mg/kg)
1. PHENOLS, TOTAL	1.4	0.10

COMPOUND LIST

- VOLATILE ORGANICS

SAMPLE IDENTIFIER: E2
COMPUCHEM® SAMPLE NUMBER: 172841

	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
1V. CHLOROMETHANE	BDL	10
2V. BROMOMETHANE	BDL	10
3V. VINYL CHLORIDE	BDL	10
4V. CHLOROETHANE	BDL	10
5V. METHYLENE CHLORIDE	20 B*	10
6V. ACROLEIN	BDL	100
7V. ACRYLONITRILE	BDL	100
8V. 1,1-DICHLOROETHYLENE	BDL	10
9V. 1,1-DICHLOROETHANE	BDL	10
10V. TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V. CHLOROFORM	BDL	10
12V. 1,2-DICHLOROETHANE	BDL	10
13V. 1,1,1-TRICHLOROETHANE	6 J	10
14V. CARBON TETRACHLORIDE	BDL	10
15V. BROMODICHLOROMETHANE	BDL	10
16V. 1,2-DICHLOROPROPANE	BDL	10
17V. TRANS-1,3-DICHLOROPROPENE	BDL	10
18V. TRICHLOROETHYLENE	BDL	10
19V. DIBROMOCHLOROMETHANE	BDL	10
20V. 1,1,2-TRICHLOROETHANE	BDL	10
21V. BENZENE	BDL	10
22V. CIS-1,3-DICHLOROPROPENE	BDL	10
23V. 2-CHLOROETHYL VINYL ETHER	BDL	10
24V. BROMOFORM	BDL	10
25V. TETRACHLOROETHYLENE	8 J	10
26V. 1,1,2,2-TETRACHLOROETHANE	BDL	10
27V. TOLUENE	BDL	10
28V. CHLOROBENZENE	BDL	10
29V. ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D ₄ -1,2-Dichloroethane	110	(70-121)
4-Bromofluorobenzene	94	(74-121)
D ₈ -Toluene	104	(81-117)

BDL=BELOW DETECTION LIMIT

J=Estimated concentration; values are between the detection limit and one-half of that limit.

*See Quality Assurance Notice

COMPOUND LIST -- ACID EXTRACTABLES

SAMPLE IDENTIFIER: E3
 COMPUCEM® SAMPLE NUMBER: 172842

	CONCENTRATION (ug/kg)	DETECTION† LIMIT (ug/kg)
1A. PHENOL	960 J	1700
2A. 2-CHLOROPHENOL	BDL	1700
3A. 2-NITROPHENOL	BDL	1700
4A. 2,4-DIMETHYLPHENOL	4300	1700
5A. 2,4-DICHLOROPHENOL	28000	1700
6A. P-CHLORO-M-CRESOL	BDL	1700
7A. 2,4,6-TRICHLOROPHENOL	110000	1700
8A. 2,4-DINITROPHENOL	BDL	8300
9A. 4-NITROPHENOL	BDL	8300
10A. 4,6-DINITRO-O-CRESOL	BDL	8300
11A. PENTACHLOROPHENOL	7200 J	8300

Surrogate Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
2-Fluorophenol	<u>54</u>	<u>(25-121)</u>
D ₅ -Phenol	<u>56</u>	<u>(24-113)</u>
2,4,6-Tribromophenol	<u>75</u>	<u>(19-122)</u>

BDL=BELOW DETECTION LIMIT

J=Estimated concentration; values are between the detection limit and one-half of that limit.

†See Quality Assurance Notice #1.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: E3
COMPUCHEM® SAMPLE NUMBER: 172842

	CONCENTRATION (ug/kg)	DETECTION†† LIMIT (ug/kg)
1B. N-NITROSODIMETHYLAMINE	BDL	3300
2B. BIS (2-CHLOROETHYL) ETHER	BDL	3300
3B. 1,3-DICHLOROBENZENE	BDL	3300
4B. 1,4-DICHLOROBENZENE	BDL	3300
5B. 1,2-DICHLOROBENZENE	BDL	3300
6B. BIS (2-CHLOROISOPROPYL) ETHER	BDL	3300
7B. N-NITROSODI-N-PROPYLAMINE	BDL	3300
8B. HEXACHLOROETHANE	BDL	3300
9B. NITROBENZENE	BDL	3300
10B. ISOPHORONE	BDL	3300
11B. BIS(2-CHLOROETHOXY) METHANE	BDL	3300
12B. 1,2,4-TRICHLOROBENZENE	BDL	3300
13B. NAPHTHALENE	1200000††	33000††
14B. HEXACHLOROBUTADIENE	BDL	3300
15B. HEXACHLOROCYCLOPENTADIENE	BDL	3300
16B. 2-CHLORONAPHTHALENE	BDL	3300
17B. DIMETHYLPHTHALATE	BDL	3300
18B. ACENAPHTHYLENE	18000	3300
19B. 2,6-DINITROTOLUENE	BDL	3300
20B. ACENAPHTHENE	160000††	33000††
21B. 2,4-DINITROTOLUENE	BDL	3300
22B. DIETHYLPHTHALATE	BDL	3300
23B. 4-CHLOROPHENYL PHENYL ETHER	BDL	3300
24B. FLUORENE	240000††	33000††
25B. DIPHENYLAMINE (N-NITROSO)	BDL	3300
26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	3300
27B. 4-BROMOPHENYL PHENYL ETHER	BDL	3300
28B. HEXACHLOROBENZENE	BDL	3300

(Continued)

BDL=BELOW DETECTION LIMIT

††These values were obtained from a 100:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the 10:1 dilution of the sample. See Quality Assurance Notice #1.

SAMPLE IDENTIFIER: E3
 COMPUCEM® SAMPLE NUMBER: 172842

	CONCENTRATION (ug/kg)	DETECTION†† LIMIT (ug/kg)
29B. PHENANTHRENE	570000††	33000††
30B. ANTHRACENE	180000††	33000††
31B. DI-N-BUTYLPHthalATE	BDL	3300
32B. FLUORANTHENE	190000††	33000††
33B. BENZIDINE	BDL	17000
34B. PYRENE	160000††	33000††
35B. BUTYLBENZYLPHthalATE	BDL	6600
36B. BENZO(A)ANTHRACENE	42000	3300
37B. 3,3'-DICHLOROBENZIDINE	BDL	6600
38B. CHRYSENE	39000	3300
39B. BIS(2-ETHYLHEXYL)PHthalATE	BDL	3300
40B. DI-N-OCTYLPHthalATE	BDL	3300
41B. BENZO(B)FLUORANTHENE	56000(1)	3000
42B. BENZO(K)FLUORANTHENE	56000(1)	3000
43B. BENZO(A)PYRENE	29000	3300
44B. INDENO(1,2,3-C,D)PYRENE	11000	3300
45B. DIBENZO(A,H)ANTHRACENE	4000	3300
46B. BENZO(G,H,I)PERYLENE	11000	3300

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D ₅ -Nitrobenzene	80	(23-120)
2-Fluorobiphenyl	55	(30-115)
D ₁₄ -Terphenyl	60	(18-137)
D ₁₀ -Pyrene*	79	*

BDL=BELOW DETECTION LIMIT

*Advisory Surrogate; therefore no control range.

††These values were obtained from a 100:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the 10:1 dilution of the sample. See Quality Assurance Notice #1.

COMPOUND LIST -- ACID EXTRACTABLES

SAMPLE IDENTIFIER: E4
 COMPUCEM® SAMPLE NUMBER: 172844

	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
1A. PHENOL	530	330
2A. 2-CHLOROPHENOL	290 J	330
3A. 2-NITROPHENOL	BDL	330
4A. 2,4-DIMETHYLPHENOL	1200	330
5A. 2,4-DICHLOROPHENOL	16000††	3300††
6A. P-CHLORO-M-CRESOL	BDL	330
7A. 2,4,6-TRICHLOROPHENOL	110000††	3300††
8A. 2,4-DINITROPHENOL	BDL	1600
9A. 4-NITROPHENOL	BDL	1600
10A. 4,6-DINITRO-O-CRESOL	BDL	1600
11A. PENTACHLOROPHENOL	760 J	1600

Surrogate Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
2-Fluorophenol	<u>58</u>	<u>(25-121)</u>
D5-Phenol	<u>57</u>	<u>(24-113)</u>
2,4,6-Tribromophenol	<u>67</u>	<u>(19-122)</u>

BDL=BELOW DETECTION LIMIT

J=Estimated concentration; values are between the detection limit and one-half of that limit.

††These values were obtained from a 10:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the undiluted sample.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: E4
COMPUCHEM® SAMPLE NUMBER: 172844

	CONCENTRATION (ug/kg)	DETECTION† LIMIT (ug/kg)
1B. N-NITROSODIMETHYLAMINE	BDL	1700
2B. BIS (2-CHLOROETHYL) ETHER	BDL	1700
3B. 1,3-DICHLOROBENZENE	BDL	1700
4B. 1,4-DICHLOROBENZENE	BDL	1700
5B. 1,2-DICHLOROBENZENE	BDL	1700
6B. BIS (2-CHLOROISOPROPYL) ETHER	BDL	1700
7B. N-NITROSODI-N-PROPYLAMINE	BDL	1700
8B. HEXACHLOROETHANE	BDL	1700
9B. NITROBENZENE	BDL	1700
10B. ISOPHORONE	BDL	1700
11B. BIS(2-CHLOROETHOXY) METHANE	BDL	1700
12B. 1,2,4-TRICHLOROBENZENE	BDL	1700
13B. NAPHTHALENE	35000	1700
14B. HEXACHLOROBUTADIENE	BDL	1700
15B. HEXACHLOROCYCLOPENTADIENE	BDL	1700
16B. 2-CHLORONAPHTHALENE	BDL	1700
17B. DIMETHYLPHTHALATE	BDL	1700
18B. ACENAPHTHYLENE	3500	1700
19B. 2,6-DINITROTOLUENE	BDL	1700
20B. ACENAPHTHENE	30000	1700
21B. 2,4-DINITROTOLUENE	BDL	1700
22B. DIETHYLPHTHALATE	BDL	1700
23B. 4-CHLOROPHENYL PHENYL ETHER	BDL	1700
24B. FLUORENE	36000	1700
25B. DIPHENYLAMINE (N-NITROSO)	BDL	1700
26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	1700
27B. 4-BROMOPHENYL PHENYL ETHER	BDL	1700
28B. HEXACHLOROBENZENE	BDL	1700

(Continued)

BDL=BELOW DETECTION LIMIT

†See Quality Assurance Notice #1.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

(Page Two)

SAMPLE IDENTIFIER: E4
 COMPUCHEM® SAMPLE NUMBER: 172844

	CONCENTRATION (ug/kg)	DETECTION† LIMIT (ug/kg)
29B. PHENANTHRENE	68000	1700
30B. ANTHRACENE	22000	1700
31B. DI-N-BUTYLPHTHALATE	BDL	1700
32B. FLUORANTHENE	29000	1700
33B. BENZIDINE	BDL	8300
34B. PYRENE	23000	1700
35B. BUTYLBENZYLPHTHALATE	BDL	1700
36B. BENZO(A)ANTHRACENE	9500	1700
37B. 3,3'-DICHLOROBENZIDINE	BDL	3300
38B. CHRYSENE	9300	1700
39B. BIS(2-ETHYLHEXYL)PHTHALATE	860 J	1700
40B. DI-N-OCTYLPHTHALATE	BDL	1700
41B. BENZO(B)FLUORANTHENE	13000(1)	1700
42B. BENZO(K)FLUORANTHENE	13000(1)	1700
43B. BENZO(A)PYRENE	6700	1700
44B. INDENO(1,2,3-C,D)PYRENE	2000	1700
45B. DIBENZO(A,H)ANTHRACENE	BDL	1700
46B. BENZO(G,H,I)PERYLENE	BDL	1700

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	<u>%Recovery</u>	<u>Control Range%</u>
D ₅ -Nitrobenzene	<u>50</u>	<u>(23-120)</u>
2-Fluorobiphenyl	<u>58</u>	<u>(30-115)</u>
D ₁₄ -Terphenyl	<u>60</u>	<u>(18-137)</u>
D ₁₀ -Pyrene*	<u>62</u>	<u>*</u>

BDL=BELOW DETECTION LIMIT

*Advisory Surrogate; therefore no control range.

J=Estimated concentration; values are between the detection limit and one-half of that limit.

(1)Indistinguishable Isomers.

†See Quality Assurance Notice #1.

COMPOUND LIST

- VOLATILE ORGANICS

SAMPLE IDENTIFIER: E4
 COMPUCEM® SAMPLE NUMBER: 172846

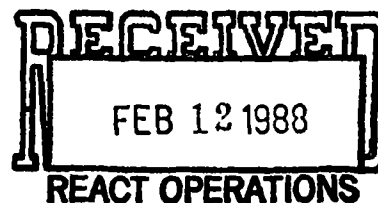
	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
1V. CHLOROMETHANE	BDL	10
2V. BROMOMETHANE	BDL	10
3V. VINYL CHLORIDE	BDL	10
4V. CHLOROETHANE	BDL	10
5V. METHYLENE CHLORIDE	55 B*	10
6V. ACROLEIN	BDL	100
7V. ACRYLONITRILE	BDL	100
8V. 1,1-DICHLOROETHYLENE	BDL	10
9V. 1,1-DICHLOROETHANE	BDL	10
10V. TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V. CHLOROFORM	BDL	10
12V. 1,2-DICHLOROETHANE	BDL	10
13V. 1,1,1-TRICHLOROETHANE	BDL	10
14V. CARBON TETRACHLORIDE	BDL	10
15V. BROMODICHLOROMETHANE	BDL	10
16V. 1,2-DICHLOROPROPANE	BDL	10
17V. TRANS-1,3-DICHLOROPROPENE	BDL	10
18V. TRICHLOROETHYLENE	BDL	10
19V. DIBROMOCHLOROMETHANE	BDL	10
20V. 1,1,2-TRICHLOROETHANE	BDL	10
21V. BENZENE	72	10
22V. CIS-1,3-DICHLOROPROPENE	BDL	10
23V. 2-CHLOROETHYL VINYL ETHER	BDL	10
24V. BROMOFORM	BDL	10
25V. TETRACHLOROETHYLENE	14	10
26V. 1,1,2,2-TETRACHLOROETHANE	BDL	10
27V. TOLUENE	56	10
28V. CHLOROBENZENE	59	10
29V. ETHYLBENZENE	650	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	<u>% Recovery</u>	<u>Control Range%</u>
D4-1,2-Dichloroethane	<u>93</u>	<u>(70-121)</u>
4-Bromofluorobenzene	<u>76</u>	<u>(74-121)</u>
D8-Toluene	<u>94</u>	<u>(81-117)</u>

BDL= BELOW DETECTION LIMIT

*See Quality Assurance Notice.



February 10, 1988

Ms. Karen Hasler
REACT
2208 Welsch Industrial Court
St. Louis, MO 63141

Attention: Ms. Karen Hasler

Subject: Report of Data - Ticket # 767

Dear Ms. Hasler:

Enclosed herewith are results of analytical work performed in accordance with EPA methodology described in IFB # WA 86-K357, the EPA method required for analysis of 2,3,7,8-tetra-chlorodibenzo-p-dioxin. This report includes data for four soils received by CHEMWEST on December 18, 1987, one method blank, a matrix spike and a matrix spike duplicate.

All blanks associated with the samples were free from contamination. All samples were analyzed on a SP 2331 column, and all data were calculated using EICP areas.

CHEMWEST experienced no technical difficulty with the analysis of these samples. All samples passed all contract required criteria upon the analysis of the first extract. The sample with client ID:E4/CC# 173006/CW# 767-4 did not contain native dioxin above the detection level and all MPC's are reported as ug/kg (ppb). The sample with client ID#:EI/CC# 172996/CW# 767-1, client ID: E2/CC# 173002/CW# 767-2, and client ID#:E3/CC# 173003/CW#767-3 contained 2,3,7,8-tetra-chlorodibenzo-p-dioxin above the detection limit. This report meets all IFB requirements concerning Quality Control and partial scans.

The report is divided into the following sections:

1. Cover Letter
2. B-(n) Summary Reports
3. Sample Data
4. Performance Check Standards (PC)
5. Shift Standards (CCL)
6. GC/MS Run Logs

Page 2
February 5, 1988
Ms. Hasler

CHEMWEST welcomes any suggestions or comments regarding our deliverables package. If you have any questions concerning this report, please contact me at 916-923-0840.

Sincerely,

Jill B. Henes, Ph.D.
Vice President of Technical Services

FORM B-1S. TCDD SOIL DATA REPORT FORM

Page 1 of 2

Lab: ChemWest
Case/Batch No.: 767
Instrument ID: CW3

Report Date: 2/05/88
Column: SP-2331

ppb

Client Sample No.	Extr. Date	Wet Wt.	ug/kg Meas.	TCDD MPC	GC/MS Date	Analysis Time	Surr. S/N Ratio	* % REC (IS)
Method Blank	1/15/88	(10.0g)	ND	0.047	01/26/88	10:50	103/1	77
E1 - 172996	1/15/88	10.09g	7.2	---	01/26/88	11:21	17.0/1	82
E2 - 173002	1/15/88	10.04g	4.9	---	01/26/88	11:49	18.6/1	84
E3 - 173003	1/15/88	10.05g	4.5	---	01/26/88	12:17	11.1/1	95
173003-MS	1/15/88	10.02g	5.7	---	01/26/88	12:43	18.3/1	84
173003-MSD	1/15/88	10.09g	6.6	---	01/26/88	13:09	10.5/1	95
E4 - 173006	1/15/88	10.03g	0.62	---	01/26/88	13:39	59.9/1	77

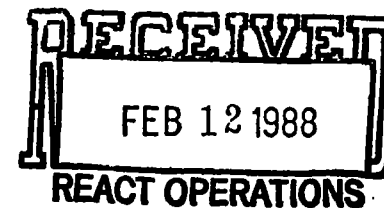
MB = Method Blank
N = Native TCDD Spike
D = Duplicate/Fortified Field Blank

FB = Field Blank
IS = Internal Standard
RR = Rerun

PE = EMSL-LV Performance Evaluation Sample
MPC = Maximum Possible Concentration
Note: Relative to 13C12-1,2,3,4-TCDD

ND = Not Detected
RS = Recovery Standard

Approved By: JBL



FORM B-1S. TCDD SOIL DATA REPORT FORM

Page 2 of 2

Lab: ChemWest
Case/Batch No.: 767
Instrument ID: CW3

Report Date: 2/05/88
Column: SP-2331

Client Sample No.	Rel. Response Ratios				Response (Area)						
	320/	332/	332/								
Number	322	334 IS	334 RS	259	320	322	328	332 IS	334 IS	332 RS	334 RS
Method Blank	---	0.78	0.78	---	---	---	981978	1018470	1300140	1270750	1628530
172996	0.73	0.83	0.79	356372	721469	894191	230421	223676	270912	1222100	1551770
173002	0.79	0.76	0.80	274660	547664	694842	263136	240543	318400	1057210	1318430
173003	0.74	0.79	0.80	79332	182853	246616	112164	115958	156505	1349100	1692430
173003-MS	0.77	0.81	0.79	208336	470248	612482	199417	187869	232262	1199040	1519550
173003-MSD	0.81	0.79	0.77	133530	243645	299752	97008	80024	101220	1347970	1742860
173006	0.73	0.78	0.77	204184	194730	266034	698208	725440	929992	1280190	1658770

MB = Method Blank
N = Native TCDD Spike
D = Duplicate/fortified Field Blank
PE = EMSL-LV Performance Evaluation Sample
MPC = Maximum Possible Concentration

FB = Field Blank
IS = Internal Standard
RR = Rerun
ND = Not Detected
RS = Recovery Standard

Approved By: JBH

FORM B-2
INITIAL CALIBRATION SUMMARY

Page 1 of 2

Laboratory: ChemWest

CC Solution Alternative: NA

Case/Batch No.: 614

Instrument ID: CW3

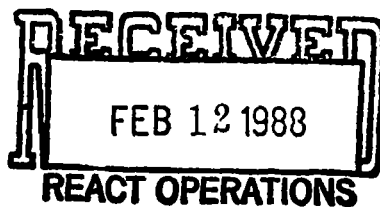
Date	Time	Sol. ID	320	322	328	332IS	334IS	332RS	334R
1/4/88	11:43	CC1	325237	424134	273484	1433650	1774450	750959	92669
1/4/88	14:49	CC1	302618	392714	249004	1323260	1662860	701172	88174
1/4/88	16:48	CC1	232250	278198	185425	964801	1251010	526208	67002
1/4/88	12:11	CC2	1325340	1703090	466876	1192150	1511530	626192	81074
1/4/88	15:14	CC2	1452350	1912100	525256	1322210	1679630	712140	88778
1/4/88	17:12	CC2	1361350	1791810	495171	1288400	1610950	640884	81381
1/4/88	13:37	CC3	4624320	6072380	585328	849536	1107430	460560	56920
1/4/88	15:38	CC3	6507930	8369500	765596	1193340	1519230	640236	80631
1/4/88	17:37	CC3	4919730	6449820	608840	915644	1189270	497637	62653
1/4/88	14:02	CC4	22469400	29477600	287664	993243	1272840	515848	65608
1/4/88	16:03	CC4	17221500	22446800	226216	776100	993362	410596	50775
1/4/88	18:01	CC4	15691000	20445400	188004	729156	912279	372676	47031

Solution ID Codes:

CC1 = Concentration calibration solution #1
CC2 = Concentration calibration solution #2
CC3 = Concentration calibration solution #3
CC4 = Concentration calibration solution #4

* Not present in CC
Solution Alternative One.

Approved By: JBL



FORM B-2
INITIAL CALIBRATION SUMMARY

Page 2 of 2

Laboratory: ChemWest

CC Solution Alternative: NA

Case/Batch No.: 614

Instrument ID: CW3

Date	Time	Sol. ID	Measured RRFn	Mean RRFn	Measured RRFi	Mean RRFi
1/4/88	11:43	CC1	1.14	1.15	1.42	1.40
1/4/88	14:49	CC1	1.15	1.15	1.38	1.40
1/4/88	16:48	CC1	1.15	1.15	1.39	1.40
1/4/88	12:11	CC2	1.12	1.11	1.39	1.39
1/4/88	15:14	CC2	1.11	1.11	1.41	1.39
1/4/88	17:12	CC2	1.09	1.11	1.38	1.39
1/4/88	13:37	CC3	1.09	1.09	1.36	1.31
1/4/88	13:37	CC3	1.1	1.09	1.27	1.31
1/4/88	17:37	CC3	1.08	1.09	1.31	1.31
1/4/88	14:02	CC4	1.16	1.13	---	---
1/4/88	16:03	CC4	1.12	1.13	---	---
1/4/88	18:01	CC4	1.1	1.13	---	---

Solution ID Codes:

CC1 = Concentration calibration solution #1
CC2 = Concentration calibration solution #2
CC3 = Concentration calibration solution #3
CC4 = Concentration calibration solution #4

%RSD: RRFn RRFi
CC1 = 1.15 1.40
CC2 = 1.10 1.39
CC3 = 1.09 1.31
CC4 = 1.13 ---

Native Mean IS Mean
Of Means : 1.12 Of Means: 1.37

Approved By: JBH

FORM B-3
ROUTINE CALIBRATION SUMMARY

Laboratory: ChemWest

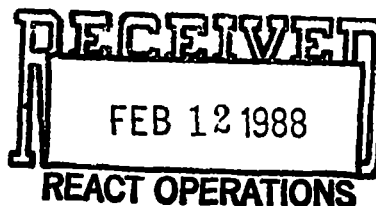
CC Solution Alternative: NA

Case/Batch No.: 767

Instrument ID: CW-3

	(PCS) PERFORMANCE CHECK SOL.		(CC1) CON. CALIB. SOL. #1	
Date	1/26/88	1/26/88	1/26/88	1/26/88
Time	9:38	18:30	10:17	18:05
Response				
259	221304	206932	266848	199597
320	404746	402700	473437	424748
322	500268	500579	606286	540888
328	111712	110336	421944	335213
332IS	1083200	1073970	2130740	1799570
334IS	1369620	1349450	27296910	2279840
332RS	1924070	1883970	1150360	965408
334RS	2434380	2399800	1465290	1202290
Ratios				
320/322	0.81	0.80	0.78	0.79
332/334IS	0.79	0.80	0.08	0.79
332/334RS	0.79	0.79	0.79	0.80
RRFn	---	---	1.11	1.18
RRFi	---	---	1.44	1.36
% Valley	4.6	1.5	---	---

Approved By: JBH



FORM B-4

QUALITY CONTROL SUMMARY

Laboratory: ChemWest

Case/Batch No.: 767

Instrument ID: CW-3

SOIL

Accuracy, Fortified/
Matrix Spike: 50%

Client Sample Number: 173003

Accuracy, Fortified/
Matrix Spike Duplicate: 86%

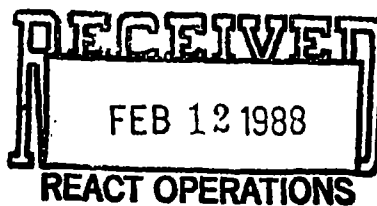
Client Sample Number: 173003

Relative Difference (%),
Duplicate Analysis: 53% *

Client Sample Number: 173003

*: The relative % difference of the total recovery was 14.9%.

Approved By: VBH



APPENDIX II

1773.2 - SUPERIOR SOLVENTS SITE
AIR MONITORING LOG

DATE: 12-4-87

PERSON RESPONSIBLE FOR READING AIR MONITORS: SUR

TIME	WIND DIRECTION	TWA PARTICULATE LEVEL (mg/m ³)		LEVEL (mg/m ³)	
		UPWIND MONITR (ID #3)	DOWNWIND MONITR (ID #1)	DOWNWIND MONITR (ID #2)	ACTION LEVEL
1. 0812	E-SE	—	—	—	—
2. 0910	E-SE	0.17	0.00	0.10	0.3645
3. 1015	E-SE	0.14	0.00	0.07	0.3375
4. 1111	E	0.12	0.00	0.08	0.3195
5. 1204	E-SE	0.10	0.00	0.06	0.3015
6. 1300	E	0.06	0.00	0.00	0.2655
7. 1401	E	0.16	0.00	0.01	0.3555
8. 1503	E-SE	0.17	0.00	0.01	0.3645
9. 1647	E-NE	0.28	0.00	0.10	0.4635
11.					
12.					
13.					
14.					
15.					

**Action Level = (Upwind TWA + 0.235) x 0.9

Additional Notes:

1515 - DISCONNECTED ALL AIR MONITORS DUE NO EXCAVATION
TAKING PLACE.

1543 - AIR MONITORS WERE RE-STARTED, WIND DIRECTION
E-SE

1773.2 - SUPERIOR SOLVENTS SITE
AIR MONITORING LOG

DATE: 12-8-97

PERSON RESPONSIBLE FOR READING AIR MONITORS: SUR

	TIME	WIND DIRECTION	TWA PARTICULATE LEVEL (mg/m ³)			ACTION LEVEL
			UPWIND MONITOR (ID #3)	DOWNWIND MONITOR (ID #1)	DOWNWIND MONITOR (ID #2)	
1.	0815	NW	—	—	—	—
2.	0908	NW	0.19	0.00	0.02	0.3825
3.	1001	NW	0.19	0.00	0.01	0.3825
4.	1053	NW	0.15	0.00	0.01	0.3465
5.	1146	NW	0.19	0.00	0.01	0.3825
6.	1244	NW	0.17	0.00	0.02	0.3645
7.	1337	NW	0.20	0.00	0.03	0.3915
8.	1426	NW	0.54	0.05	0.05	0.6975
9.	1512	NW	0.54	0.09	0.05	0.6975
10.						
11.						
12.						
13.						
14.						
15.						

**Action Level = (Upwind TWA + 0.235) x 0.9

Additional Notes:

0815 - Turned on all three air monitors to start the work day.
1530 -

1773.2 - SUPERIOR SOLVENTS SITE
AIR MONITORING LOG

DATE: 12-9-87

PERSON RESPONSIBLE FOR READING AIR MONITORS: SUR

	TIME	WIND DIRECTION	TWA PARTICULATE LEVEL (mg/m ³)			ACTION LEVEL
			UPWIND MONITOR (ID #1)	DOWNWIND MONITOR (ID #2)	DOWNWIND MONITOR (ID #3)	
+1.	0846	NE	—	—	—	—
2.	0940	NE	0.00	0.06	0.60	0.2115
- 3.	0948	NE	— #3	— #2	— #1	—
4.	1018	NE	0.49	0.06	0.00	0.6525
✓ 5.	1112	—	0.56	0.07	0.03	0.7155
6.	1117	NE	— #3	— #2	— #1	—
7.	1215	NE-E	0.41	0.00	0.00	0.5805
8.	1317	NE	0.41	0.00	0.00	0.5805
9.	1413	NE-E	0.45	0.17	0.27	0.6165
10.	1508	NNE	0.46	0.09	0.14	0.6255
11.	1606	NE	0.51	0.00	0.00	0.6705
12.						
13.						
14.						
15.						

AVG DOWN 0.3

**Action Level = (Upwind TWA + 0.235) x 0.9

Additional Notes:

- + 0846 - Started all three monitors for start of Day.
- 0948 - Switched Monitor ID #1 and #3 around per Ken Brooks of Woodward-Clyde (Representing EPA)
- #1018 - Per JRS & Ken Brooks (Woodward-Clyde) Stopped all monitors for stabilization.

- STABILIZATION OF MONITORS INSIDE BUILDING WITH NO WIND DIRECTION
- 0 - RESTARTED MONITORS AFTER STABILIZATION INSIDE BUILDING
- ✓ - FUMES FROM THE CUTTING-TORCH MADE DOWN WIND READING HIGHER THAN PREVIOUS, NO EXCAVATION GOING ON.

1773.2 - SUPERIOR SOLVENTS SITE
AIR MONITORING LOG

DATE: 12-10-97

PERSON RESPONSIBLE FOR READING AIR MONITORS: SUR

#	TIME	WIND DIRECTION	TWA PARTICULATE LEVEL (mg/m ³)			ACTION LEVEL
			UPWIND MONITR (ID #3)	DOWNWIND MONITR (ID #1)	DOWNWIND MONITR (ID #2)	
# 1.	0817	-	-	-	-	-
+ 2.	0907	-	0.56	0.02	0.14	0.7455
✓ 3.	0912	NW	-	-	-	-
4.	1008	NW	0.56	0.00	0.07	0.7455
5.	1059	NW	0.61	0.00	0.06	0.7605
(D) 6.	1200	NW	0.56	0.05	0.16	0.7155
7.	1300	NW	0.54	0.00	0.00	0.6975
8.	1350	NW-N	0.55	0.00	0.00	0.7065
9.	1450	NW	0.49	0.00	0.00	0.6525
10.	1557	NW-N	0.50	0.00	0.00	0.6615
11.						
12.						
13.						
14.						
15.						

**Action Level = (Upwind TWA + 0.235) x 0.9

Additional Notes:

MONITORS TURNED ON INSIDE BUILDING TO STABILIZE

+ READING INSIDE BUILDING

✓ - STARTED MONITORS OUTSIDE, THE BUILDING

⊖ FUMES FROM CUTTING TORCH.

1773.2 - SUPERIOR SOLVENTS SITE
AIR MONITORING LOG

DATE: 12-11-97

PERSON RESPONSIBLE FOR READING AIR MONITORS: SUR

	TIME	WIND DIRECTION	TWA PARTICULATE LEVEL (mg/m ³)			ACTION LEVEL
			UPWIND MONITR (ID #3)	DOWNWIND MONITR (ID #1)	DOWNWIND MONITR (ID #2)	
/ 1.	0839	—	—	—	—	—
- 2.	0931	—	0.67	0.11	0.16	0.8145
- 3.	0936	NE-E	—	—	—	—
4.	1027	NE	0.50	0.00	0.08	0.6615
5.	1115	NE-E	0.50	0.00	0.08	0.6615
6.	1210	NE-	0.59	0.00	0.09	0.7425
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						

**Action Level = (Upwind TWA + 0.235) x 0.9

Additional Notes:

/ STARTED MONITORS INSIDE BUILDING FOR CALIBRATION

+ READINGS INSIDE BUILDING.

- STARTED MONITORS OUTSIDE BUILDING

1773.2 - SUPERIOR SOLVENTS SITE
AIR MONITORING LOG

DATE: 12-14-87

PERSON RESPONSIBLE FOR READING AIR MONITORS: SUR

	TIME	WIND DIRECTION	TWA PARTICULATE LEVEL (mg/m ³)			ACTION LEVEL
			UPWIND MONITR. (ID #3)	DOWNWIND MONITR. (ID #1)	DOWNWIND MONITR. (ID #2)	
# 1.	0825	—	—	—	—	—
2.	0917	—	0.61	0.07	0.11	0.7605
+ 3.	0921	SW	—	—	—	—
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						

**Action Level = (Upwind TWA + 0.235) x 0.9

Additional Notes:

MONITORS TURNED ON INSIDE BUILDING FOR CALIBRATIONS.
 @ READINGS INSIDE BUILDING FOR CALIBRATIONS PURPOSE ONLY.
 + DUE TO WEATHER CONDITIONS OUTSIDE (SNOWING); MONITORS
 WERE NOT SET UP.

APPENDIX III

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-4-87
2. TIME ON-SITE: 07:30 AM
3. TIME OFF-SITE: 05:30 PM
4. WEATHER: CLEAR, SUNNY, COLD
5. PERSONNEL ENTERING EXCLUSION ZONE:

- | | |
|----------------------------|--------------------------|
| 1. <u>JOHN DERRY</u> | 6. <u>CHRIS BIELLIER</u> |
| 2. <u>CHARLIE BRABAND</u> | 7. _____ |
| 3. <u>JOHN GRONECK</u> | 8. _____ |
| 4. <u>EARL DOWELL</u> | 9. _____ |
| 5. <u>JONATHAN SPENCER</u> | 10. _____ |

6. TASKS ACCOMPLISHED:

- A. 6 ROLL-OFFS DELIVERED W/ LIDS
B. 3 ROLL-OFFS FILLED WITH SOIL FROM PILE
(HALF OF PILE STILL REMAINING)
C. CUT TOP OFF OF TANK + PLACED IN ROLL-OFF
D. MOVED LARGE, ABOVE-GROUND TANK IN ROLL-OFF
STORAGE AREA + PLACED 1 ROLL-OFF IN THIS
STORAGE AREA

7. AIR MONITORING SUMMARY (particulate levels in $\mu\text{g}/\text{m}^3$):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1. 09:10	170	0	100	365
2. 10:15	140	0	70	338
3. 11:11	120	0	80	320
4. 12:04	100	0	60	302
5. 13:00	60	0	0	266
6. 14:01	160	0	10	356
7. 15:03	170	0	10	365
8. 16:47	280	0	100	464
9. _____				
10. _____				

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-8-87
2. TIME ON-SITE: 07:35 AM
3. TIME OFF-SITE: 03:35 PM
4. WEATHER: 48°, CLOUDY, DAMP
5. PERSONNEL ENTERING EXCLUSION ZONE:

1. <u>JONATHAN SPENCER</u>	6. <u>EARL DOWELL</u>
2. <u>CHARLIE BRABAND</u>	7. <u>CHRIS BELLIER</u>
3. <u>JOHN GRONECK</u>	8. _____
4. <u>JEFF ETTER</u>	9. _____
5. <u>JOHN DERBY</u>	10. _____

6. TASKS ACCOMPLISHED:

- (A) STAGED 3 ADDITIONAL ROLL-OFF CONTAINERS IN STORAGE AREA
- (B) USED AIR HAMMER TO CHIP OUT MOST OF THE SLUDGES ATTACHED TO THE SIDEWALLS OF TANK
- (C) USED TRACK EXCAVATOR TO REMOVE SOILS ADJACENT TO ~~####~~ TANK + PLACED IN PILE

7. AIR MONITORING SUMMARY (particulate levels in ug/m³):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1. 9:08	190	0	20	383
2. 10:01	190	0	10	383
3. 10:53	150	0	10	347
4. 11:46	190	0	10	383
5. 12:44	170	0	20	365
6. 13:37	200	0	30	392
7. 14:26	540	50	50	698
8. 15:12	540	90	50	698
9. _____				
10. _____				

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-9-87
 2. TIME ON-SITE: 8:00 AM
 3. TIME OFF-SITE: 4:45 PM
 4. WEATHER: SUNNY 55°

5. PERSONNEL ENTERING EXCLUSION ZONE:

1. <u>JONATHAN SPENCER</u>	6. <u>CHRIS BIELEW</u>
2. <u>CHARLIE BRABAND</u>	7. _____
3. <u>EARL DOWELL</u>	8. _____
4. <u>JEFF ETTER</u>	9. _____
5. <u>JOHN GRONECK</u>	10. _____

6. TASKS ACCOMPLISHED:

- ① CONTINUED EXCAVATION OF SOILS/SLUDGES AROUND TANK
- ② REMOVED TANK FROM GROUND; BEGAN CUTTING UP TANK TO PUT IN ROLL-OFFS

7. AIR MONITORING SUMMARY (particulate levels in ug/m³):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1. 9:40	0	60	600	212
2. 10:18*	490	60	0	653
3. 11:12*	560	70	30	716
4. 12:15	410	0	0	581
5. 13:17	410	0	0	581
6. 14:13	450	170	270	617
7. 15:08	460	90	140	623
8. 16:06	510	0	0	671
9.	* SWITCHED MONITORS #1 AND #3			
10.	* TAKEN INSIDE OF OFFICE TO CHECK MONITORS			

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-10-87
 2. TIME ON-SITE: 8:00 AM
 3. TIME OFF-SITE: 4:30 PM
 4. WEATHER: SUNNY 55°F

5. PERSONNEL ENTERING EXCLUSION ZONE:

1. <u>CHARLIE BRABAND</u>	6. _____
2. <u>JONATHAN SPENCER</u>	7. _____
3. <u>EARL DOWELL</u>	8. _____
4. <u>JOHN GRONECK</u>	9. _____
5. _____	10. _____

6. TASKS ACCOMPLISHED:

- ① CUT-UP TANK AND CONTAINERIZED IN ROLL-OFF
- ② SECURED LIDS ON ROLL-OFFS #1-8
- ③ TOUR BY EPA PERSONNEL (PAULETTA FRANCE-ISETT)
- ④ CLEANED EXCAVATION BOTTOM w/ HAND TOOLS
- ⑤ COLLECTED SPLIT SAMPLE OF CONDUIT CONTENTS
- ⑥ COLLECTED SOIL SAMPLES FROM BOTTOM OF EXCAVATION

7. AIR MONITORING SUMMARY (particulate levels in ug/m³):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1. 9:07*	560	20	140	720
2. 10:08	560	0	70	720
3. 10:59	610	0	60	761
4. 12:00	560	50	160	720
5. 13:00	540	0	0	698
6. 13:50	550	0	0	707
7. 14:50	490	0	0	653
8. 15:57	500	0	0	662
9. _____	_____	_____	_____	_____

10. * READINGS TAKEN INSIDE BUILDING TO CALIBRATE

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-11-87
2. TIME ON-SITE: 8:00 AM
3. TIME OFF-SITE: 3:30 PM
4. WEATHER: SUNNY, 55°F
5. PERSONNEL ENTERING EXCLUSION ZONE:
 1. JONATHAN SPEUCER
 2. CHARLIE BRABAND
 3. JOHN GRONECK
 4. EARL DOWELL
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____

6. TASKS ACCOMPLISHED:

- ① LINED EXCAVATION WITH GEO-FABRIC
- ② BACKFILLED EXCAVATION WITH SAND
- ③ MOVED ROLL-OFF #5, #6, #7 INTO STORAGE AREA
- ④ STENCILED ROLL-OFF NUMBERS ONTO ROLL-OFF #1-8

7. AIR MONITORING SUMMARY (particulate levels in ug/m³):

	TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1.	9:31*	670	110	160	815
2.	10:27	500	0	80	662
3.	11:15	500	0	80	662
4.	12:10	590	0	90	743
5.	PILE COVERED -- NO FURTHER MOVEMENT OF				
6.	CONTAMINATED SOIL TODAY				
7.					
8.					
9.	* READINGS TAKEN INSIDE BUILDING TO CALIBRATE MONITORS				
10.					

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-14-87
2. TIME ON-SITE: 8:00 AM
3. TIME OFF-SITE: 11:30 AM
4. WEATHER: 31°, HEAVY SNOWFALL
5. PERSONNEL ENTERING EXCLUSION ZONE:
 1. CHARLIE BRABAND
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____
6. TASKS ACCOMPLISHED:

① ROLL-OFFS #9-10 WERE DELIVERED AND
FILED WITH SOIL FROM THE PILE

7. AIR MONITORING SUMMARY (particulate levels in $\mu\text{g}/\text{m}^3$):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1.	MONITORS WERE CALIBRATED INSIDE			
2.	BUILDING; NO READINGS TAKEN DUE			
3.	TO ADVERSE WEATHER CONDITIONS			
4.	_____			
5.	_____			
6.	_____			
7.	_____			
8.	_____			
9.	_____			
10.	_____			

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-17-87
2. TIME ON-SITE: 8:00 AM
3. TIME OFF-SITE: 4:00 PM
4. WEATHER: COLD + SUNNY w/ ICE ON-SITE
5. PERSONNEL ENTERING EXCLUSION ZONE:
 1. CHARLIE BRABAND
 2. _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____

6. TASKS ACCOMPLISHED:

- ① COMPLETED CONTAINERIZATION OF SOIL PILE WITH ROLL-OFFS #11,12
- ② PICKED UP PLASTIC + GEOFABRIC + PLACED IN ROLL-OFF
- ③ MOVED ROLL-OFFS INTO FINAL STORAGE POSITION, STENCILED NUMBERS + LOCKED ALL REMAINING ROLL-OFFS
- ④ 30 TONS OF GRAVEL SPREAD OVER HOLE

7. AIR MONITORING SUMMARY (particulate levels in ug/m³):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1.	NO AIR MONITORING -- MONITORS WILL			
2.	NOT FUNCTION AT TEMPERATURES < 32°F			
3.	SITE WAS EXTREMELY WET DUE TO			
4.	MELTING SNOW + ICE. NO WIND AND			
5.	NO VISIBLE DUST EMISSIONS.			
6.	_____			
7.	_____			
8.	_____			
9.	_____			
10.	_____			

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

1773.2 - SUPERIOR SOLVENTS SITE
DAILY ACTIVITIES LOG

1. DATE: 12-18-87
2. TIME ON-SITE: 8:00 A.M.
3. TIME OFF-SITE: 12:00 NOON
4. WEATHER: CLOUDY, 20°F
5. PERSONNEL ENTERING EXCLUSION ZONE:

- | | |
|---------------|-----------|
| 1. _____ | 6. _____ |
| 2. <u>N/A</u> | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

6. TASKS ACCOMPLISHED:

- ① RECEIVED 43 TONS OF 1"-MINUS GRAVEL TO COMPLETE BACKFILL OF HOLE AND TO PLACE OVER SITE OF PILE
- ② COMPACTED BACKFILL w/ TRACK EXCAVATOR
- ③ DECON OF BACKHOE + TRACK EXCAVATOR w/ SOAP SOLUTION
- ④ DEMOBILIZATION AND ACETONE

7. AIR MONITORING SUMMARY (particulate levels in ug/m³):

TIME	UPWIND MONITOR	DOWNWIND #1	DOWNWIND #2	ACTION LEVEL
1. _____				
2. <u>NO MONITORING REQUIRED</u>				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				

8. PROJECT MANAGER SIGNATURE:

Jonathan Spencer

APPENDIX IV



RYCKMAN'S EMERGENCY ACTION & CONSULTING TEAM

December 16, 1987
PROJECT 1773.2

FEDERAL EXPRESS

Compuchem Labs
ATTN: Environmental Receiving
3308 Chapel Hill/Nelson Highway
Research Triangle Park, NC 27709

Sirs:

This letter transmits 4 soil samples. Enclosed is the sample transmittal form, which should provide you with any information you will need regarding the contents.

Please note that billing for the sample tests will be handled by our purchase order number 5731 as discussed with Brenda Seith.

Please call Thursday to confirm receipt of samples. Thank you.

Sincerely,

Jonathan R. Spencer
Environmental Engineer

Attachment

Enclosure

JRS:kgh





RYCKMAN'S EMERGENCY ACTION & CONSULTING TEAM

SAMPLE TRANSMITTAL FORM

Page 1 of 1

PROJECT NO: 1773.2 DATE: 12-15-87 PURCHASE ORDER NO: 5731

LAB INFORMATION:

Contact Name and Title: Brenda Seith

Lab Name: CompuChem Laboratories

Street Address: 3308 Chapel Hill/Nelson Highway

City, State and Zip: Research Triangle Park, NC 27709

Phone Number: (800) 833-5097

MODE OF TRANSPORT (check one):

- ☒ Courier (Indicate name of courier service): Federal Express
☐ REACT Drop Off
☐ Lab Pick Up
☐ Other (explain): _____

RESULTS REQUIRED, DATE: January 15, 1988 TIME: 09:00 am
Verbal telephone report requested, with written report to follow.

VERBAL TELEPHONE RESULTS TO: Karen Hasler, Administrative Secretary
REACT; 314/569-0991 or 800/325-1398

SEND WRITTEN RESULTS TO: Karen Hasler, Administrative Secretary
REACT; PO Box 27310; St. Louis, MO 63141

SAMPLE STATUS (check one):

- ☒ Retain, do not destroy unless authorized by REACT.
☐ Return samples to REACT
☐ Destroy after analysis
☐ Other (explain): _____

=====	
SAMPLE NUMBER	ANALYSIS REQUESTED
=====	
E-1 and E-3	2,3,7,8-TCDD, Semi-Volatile Scan, Total Phenols

E-2 and E-4	2,3,7,8-TCDD, Semi-Volatile Scan, Total Phenols, BNA Volatile Scan

	Please run one (1) fortified Matrix Spike for TCDD on Sample E-4

	NOTE: All 2,3,7,8-TCDD analyses are to be run using EPA's

	approved methodology (IFB WA86-K357) for Contract Labs

FORMS:smpltrns.frm(1)8/28/87 vmt



5.

Jonathan Spencer
X SEALED UNSEALED

0630-2931-9

12-15-87



From (Your Name) Jonathan R. Spencer		Your Phone Number (Very Important) (314) 569-0991	
Company REACT Div of D W Ryckman and Assoc		Department/Floor No	
Street Address 2208 Welsch Industrial Court			
City St Louis		State MO	

To (Recipient's Name) Environmental Receiving		Recipient's Phone Number (Very Important) (800) 833-5097	
Company CompuChem Laboratories		Department/Floor No	
Exact Street Address (Use of P.O. Boxes or P.O. + Zip Codes Will Delay Delivery And Result in Extra Charge) 3308 Chapel Hill/Nelson Highway			
City Research Triangle Park		State NC	

AIRBILL NO. **367566721**ZIP *Zip Code Required For Correct Invoicing
63146ZIP Street Address Zip Required (e.g. 98001)
27709YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)
1773.2HOLD FOR PICK-UP AT THIS FEDERAL EXPRESS STATION:
Street Address (See Service Guide or Call 800-238-5355)

PAYMENT ☒ Bill Shipper ☐ Bill Recipient's FedEx Acct No ☐ Bill 3rd Party FedEx Acct No ☐ Bill Credit Card

☐ Cash ☐ FedEx Acct No or Major Credit Card No

City State

4 SERVICES
CHECK ONLY ONE BOXDELIVERY AND SPECIAL HANDLING
CHECK SERVICES REQUIRED

PACKAGES WEIGHT YOUR DECLARED VALUE (See right) OVER SIZE

ZIP *Zip Code of Street Address Required

PRIORITY 1

☐ Overnight Delivery Using Your Packaging When using ICAO regulations, please mark appropriate box(es). Do not mark for CFR 49.

☒ Cargo Aircraft only

☐ Dangerous goods as per attached Dangerous Goods Transport Document

STANDARD AIR

☐ Delivery not later than second business day

SERVICE COMMITMENT

PRIORITY 1 - Delivery is scheduled early next business morning in most locations it may take 1-3 or more business days if the destination is outside our primary service areas.

STANDARD AIR - Delivery is generally next business day or not later than second business day. It may take three or more business days if the destination is outside our primary service areas.

1 ☐ HOLD FOR PICK-UP Give the Federal Express address where you want package held in **Box(es)** # at right (Restricted Articles hold service is not available at Business Service Centers.)

2 ☒ DELIVER WEEKDAY

3 ☐ DELIVER SATURDAY (Extra charge applies)

4 ☒ RESTRICTED ARTICLES SERVICE (R-1 and Standard Air Packages only. Extra charge applies)

5 ☐ CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge applies)

6 ☐ DRY ICE (Extra charge applies)

7 ☐ OTHER SPECIAL SERVICE

8 ☐

9 ☐ SATURDAY PICK-UP OR SATURDAY DROP-OFF (Extra charge applies)

Received At:
Shipper's Door
☐ Regular Stop
☐ On-Call Stop
☐ FedEx Loc

Federal Express Corp. Employee No

Date/Time For Federal Express Use

YOUR DECLARED VALUE

DAMAGE OR LOSS

We are liable for no more than \$100 per package in the event of physical loss or damage, unless you file a higher Declared Value to the left and document higher actual loss in the event of a claim. We charge \$0.50 for each additional \$100 of declared value up to the maximum shown in our Service Guide. Declared value restrictions are shown on the back of the Shipper's Copy of this form. We make no express or implied warranties.

DELAY

There is always a risk of late delivery or non-delivery. In the event of a late delivery Federal Express will, at your request, refund all transportation charges paid. See back of Shipper's Copy of this form for further information.

CONSEQUENTIAL DAMAGES

We will not be responsible or liable for any loss or damage resulting from delay, non-delivery or damage to a package except as noted above. This includes loss of sales, income, profits, attorney fees and other costs, but is not limited to these items. Such damages are called "consequential damages."

Federal Express

Base Charges

Declared Value Charge

Origin Agent Charge

Total Charges

PART # 2041730761

REVISION DATE PRINTED U.S.A.

AIRBILL NUMBER

367566721

SHIPPER'S CERTIFICATION FOR RESTRICTED ARTICLES/DANGEROUS GOODS

CHECK ONE ☒ 49 CFR ☐ ICAO

(TYPE OR PRINT)

NO. OF PKGS.	DANGEROUS GOODS IDENTIFICATION				TOTAL NET QUANTITY	PACKING INSTRUCTIONS	AUTHORIZATION
	PROPER SHIPPING NAME	CLASS OR DIVISION	UN OR ID NO.	SUBSIDIARY RISK			
1	Flammable Solid, NOS	Flammable Solid	UN 1325		1 pound	4 16-oz sample jars in paint cans	
ADDITIONAL DESCRIPTION REQUIREMENTS FOR RADIOACTIVE MATERIALS (SEE BACK)		RADIONUCLIDE	FORM	ACTIVITY	CATEGORY OF LABELS	TRANS. INDEX	PACKAGE IDENTIFICATION
			N/A		WHITE I YELLOW II YELLOW III NONE		
TRANSPORT DETAILS		THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR		PASSENGER AIRCRAFT	CARGO AIRCRAFT ONLY	(DELETE-NONAPPLICABLE)	
AIRPORT OF DEPARTURE		AIRPORT OF DESTINATION		SHIPMENT TYPE	NON-RADIOACTIVE	RADIOACTIVE	(DELETE-NONAPPLICABLE)

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN RESEARCH, MEDICAL DIAGNOSIS OR TREATMENT.

I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME AND ARE CLASSIFIED, PACKED, MARKED, AND LABELED, AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY AIR ACCORDING TO THE APPLICABLE INTERNATIONAL AND NATIONAL GOVERNMENT REGULATIONS.

Jonathan Spencer / Environmental Engineer

St Louis, MO December 15, 1987

(314) 325-1373

SEE WARNING

PLEASE PRINT OR TYPE